Interview
The Dialogical, the Ecological and Beyond
Jon Goodbun and Ben Sweeting

In this article Jon Goodbun and Ben Sweeting engage in a conversation about design and its complex relation to communication. Their dialogue was prompted by the following question from this issue's editors:

> If one approaches cybernetics as the study of information processes, the focus is no longer only on digital logics, but rather on the production, exchange and consumption of meaning. In other words, cybernetisation can set forward a relational account that focuses on how 'asignifying signs' are produced and exchanged within complex systems of any kind. As such, is it possible to understand the contemporary processes of cybernetisation as a way of ridding architecture of the linguistic burdens of its past? Moreover, in what ways can this shift in architectural logics be related to the political and ethical questions confronted by architects grappling with the complexities of ecological crises?

Ben Sweeting: I think we might begin with just the first part of the editors' prompt. Information is a good place to start with cybernetics, but there are multiple conceptions of 'information' in relation to cybernetics, and it is helpful to pull these apart.

I think it is conventional to think of information in the sense of the content of messages. This is the context of Shannon's information theory, which is closely aligned with initial developments in cybernetics, with its focus on communication. However, message transmission is very different to the notions of conversation and circularity that are at the core of

cybernetics as it develops, and it is these concepts that give cybernetics its continuing relevance in contemporary design discussions. Conversation and circularity are complex and rewarding, but it is the simpler message-in, message-out version of information that is dominant in how most people think about information, and this is reinforced in the design of many of our technologies.

One place this contrast is particularly clear is Pask's 'The Limits of Togetherness'.[1] There he sharply differentiates conversation and communication (in the sense of message transmission):

> Communication and conversation are distinct, and they do not always go hand in hand. Suppose that communication is liberally construed as the transmission and transformation of signals. If so, conversation requires at least some communication. But, enigmatically perhaps, very bad communication may admit very good conversation and the existence of a perfect channel is no guarantee that any conversation will take place.[2]

What I love about Gordon Pask's conversation theory is that it explains a way for achieving agreement that maintains (and requires) the differences between participants to be maintained. When we think of communication in terms of the passing and receiving of messages, then we try to equate what is heard with what is said. Communication as message transmission is thus conservative, in that it aims to minimise new understanding from arising. It can also be violent, in that the listener's

meaning is to be reduced to that of the speaker's intention. Conversation, by contrast, is something that welcomes new meanings and requires us to adopt the standpoints of others. I find this conception of conversation makes sense of Pask's various contributions to architecture, and it is also helpful in articulating what is so special about what designers do.[3] Another important conception of information in cybernetics is that of Gregory Bateson. Bateson also associates information with difference, but in a different way and context to Pask.

Jon Goodbun: That is a wonderful quote! Pask's conception of conversation is an important one, and there are a few things that it makes me want to bring into this conversation here. I am immediately thinking about the work of the very interesting theoretical physicist David Bohm around dialogue.[4] Bohm's thought does not easily fit into a classic cybernetic account, but he was very much a systems-theoretic thinker. Bohm reminds us that there is an important distinction between discussion and dialogue. Discussion shares a common root with words like percussion, and basically means to break things up. So maybe discussion describes a message transmission in a reductive mode, of breaking things up for analysis, and so on. Dialogue has a very different meaning. It is funny, in that we often have an internal mistranslation of dialogue, thinking that the 'dia' means two and imagining that dialogue therefore means between two people, but that is not the case. Actually, it means 'through the word', and for Bohm it suggested a mode of communication much closer to Pask's account of conversation, in that in dialogue there is a more 'ecological' flow of meaning between, through and around participants. There is a sense that the dialogue itself, the conversation, has a degree of internal autonomy and a more holistic coherence beyond the 'intentions' of any individual speech act.

It is interesting, I think, to also note that forms of dialogue – often directly referencing some of the Bohmian Dialogue techniques – has been adopted by Extinction Rebellion in their assemblies, and of course that there are all kinds of parallels in various anarcho-leftist participatory democratic practices.[5] I have been thinking about dialogic structures as a part of an outline of an environmental semiotics that include human and other actors, signifying and asignifying signs, both as a tool for understanding ecological interactions, and also as a tool for thinking about a kind of dialogic or conversational 'ecological planning'. I have been using dialogue as a way of approaching Green New Deal thinking, for example.

It is interesting to bring Bateson into this conversation too. So of course, Bateson experimented with the conversational form as a rhetorical tool and explanatory device in his 'metalogues'. And working with bringing multiple perspectives together (which I think is one of the things at stake in Pask's model of conversation) was always a key method for him, going right back to his early anthropological work *Naven*, which was the study of the meaning of a particular ceremony from 'three points of view'. There is something fundamentally polyphonic and multi-perspectival in the work of Pask and Bateson, and more generally in what I think of as the radical tendency within cybernetics. We find here a recognition of the need to hold multiple points of view together in a properly dialectical tension. This is very useful for us today in thinking about ecological systems and our interactions and conversations with them, but also in thinking about the kinds of democratic and decision-making processes that we might need going forwards…

Bateson defined information as 'a difference that makes a difference', that is, you always need something or someone that is sensitive to a given difference in a field, and to recognise it as such. There is always a context and an observing system. Furthermore, he then saw learning, evolution, and biological morphology as fundamentally interconnected and isomorphic processes. He would state for example that

whatever the word 'story' means … the fact of thinking in terms of stories does not isolate human beings as something separate from the starfish and the sea anemones, the coconut palms and the primroses. Rather, if the world be connected, if I am at all fundamentally right in what I am saying, then thinking in terms of stories must be shared by all mind or minds whether ours or those of redwood forests and sea anemones.

Context and relevance must be characteristic not only of all so-called behavior (those stories which are projected out into 'action'), but also of all those internal stories, the sequences of the building up of the sea anemone. Its embryology must be somehow made of the stuff of stories. And behind that, again, the evolutionary process through millions of generations whereby the sea anemone, like you and me, came to be – that process, too, must be of the stuff of stories. There must be relevance in every step of phylogeny and among the steps.[6]

BS: That is a great way of distinguishing dialogue from mere discussion, and relevant to our time. With the pandemic moving so much online, it is easier than ever to end up passing messages rather than conversing. I think part of the reason we often think of dialogue in terms of two participants is that in it every participant is always moving between two modes – speaking (adding content) and listening (building understanding of the content introduced by others). If we only do one, we obstruct dialogue. This is obvious when someone speaks but does not listen, but I think it is also the case when someone listens but does not speak or passively agrees, as then they are not offering something new to others. The etymology of conversation is to 'turn about with' – which I think of as continually turning between listening and speaking (and their equivalents).

For me, the important bit of Pask's conversation theory is how it explains how we can act as if we understand the same thing without requiring us to reduce one understanding to the other. Imagine students trying to explain how they understand

something – ideas for their design projects, say. They might present this to their tutors and to each other. At the same time, maybe the tutors have something they need to get across – perhaps some different interpretation of the project or some idea about which direction to develop the design. Neither party can just pass their meaning on. The listeners build their own understanding of what the speakers understand. To check how well they have understood, they might well ask something like 'do you mean like this?' By listening to how the others respond, one can get a sense of whether you have been understood. But it is not like you are comparing your understanding to that of others – instead, you compare your understanding of what you are trying to share to your understanding of others' understanding of your understanding. This reflexivity explains how we can coordinate action as if we understand the same thing, while maintaining the differences between how and what we understand. As well as avoiding the need for the sort of questionable assumptions required by a code-decode model, I find this is an ethically and politically desirable way to work with others. Indeed, to 'turn about with' (conversation) originally had the meaning of living with or even dwelling.

There is plenty more in conversation theory, but this basic process is the part that Ranulph Glanville would always focus on, using it to bring design and cybernetics into close relation.[7] I find that it is helpful in the context of other conversational frameworks in thinking through the underlying mechanism, and also in teaching, where it reminds me that I am not trying to get students to have the same understanding I have (which would be a form of reducing difference). I find it is often productive when students see things in what I say that I did not anticipate and vice versa. 'Do you mean like this…?' might be a confirmation, but it is often something that one had not meant, creating new connections, questions, and insights. This way my students do things that are beyond what I can do or explain. So, it is not just that conversation does not reduce

difference, it is driven by difference and produces it. The role of participant (in conversation theory: psychological individual, or p-individual) is quite flexible for Pask – it does not necessarily correspond to the ways in which we are embodied (mechanical individual, or m-individual). I can talk with myself, moving between two or more participant positions, or a whole group of people, say an institution, might act as one participant in a conversation. When Pask worked with Nicholas Negroponte on machine intelligence, his focus was on whether the dialogue 'manifests understanding', which is a quality of the interaction rather than a comment on the knowledgeability of the participants.[8] Many of the algorithmic technologies we call smart show little in the way of understanding – and I can think of plenty of human-to-human interactions that have similar shortcomings.[9] Perhaps, coming back to Bateson, something similar might be said of how humans have interacted with their environment?

JG: Yes, I think you have captured it beautifully there when you state that 'it's not just that conversation doesn't reduce difference, it's driven by it and produces it'. This captures the difference between a conversation and control in our relationships with our environments. We know from Ashby's Law of Requisite Variety that control systems will reduce difference and complexity in the systems that they control if they lack the same levels of complexity, and the conversational model provides a much more open basis for proceeding.[10]

Bateson found Pask's work on this very interesting and invited him to his conference in 1968 at Burg Wartenstein on 'Effects of Conscious Purpose on Human Adaptation'.[11] This was an event which was precisely concerned with thinking about whether we can change and adapt our ways of thinking, planning, and perceiving, and which was framed by the then strongly emerging evidence of anthropogenic environmental crisis. For Bateson, the question of what he called human 'conscious purpose', of planning basically, was key to

understanding the environmental crisis, because he saw that the environmental crisis had a significant epistemological component: our conscious purpose necessarily works on the basis of selective representations, or maps of the world, and we export the simplicity and reduced variety of our maps, now amplified by technology, back out into our worlds.

The core of the paradox of consciousness is that it is unable to see its own conditions of production (or at least, not directly, as an object of consciousness). Furthermore, we tend to experience the productions of consciousness as the totality of our mental processes. But of course, they are nothing of the kind. Bateson sometimes liked to describe this in terms of arcs and loops, where we might think of our sense of self situated both as, and within, extended entanglements of looping eco-mental relationships. However, the screen of consciousness only perceives small sections of arcs of these looping relations. Bateson described – and we need to forgive him his pronouns here – three interacting levels to these ecosystems, something that Félix Guattari would develop further in *The Three Ecologies*.[12] Still, as Bateson claims:

> On the one hand, we have the systemic nature of the individual human being, the systemic nature of the culture in which he lives, and the systemic nature of the biological, ecosystem around him; and on the other hand, the curious twist in the systemic nature of the individual man whereby consciousness is, almost of necessity, blinded to the systemic nature of the man himself. Purposive consciousness pulls out, from the total mind, sequences which do not have the loop structure which is characteristic of the whole systemic structure.[13]

This tendency of modern human consciousness to not perceive its part-of-a-system character, to not recognise that what it sees as small linear chains of (signifying) relationships are always also participants in much bigger webs of (asignifying) relationships, is not necessarily a problem, as consciousness is

only one of the forms of mental relations that we participate in. It is not that we should consider consciousness to necessarily be a bad move! But we should attend to its context, its ecology, its relation to various other forms of cognition, language, and communication, its social and technical production, and how easily it can slip into what Bateson sometimes referred to as 'epistemological error' (and only then can we engage in the personal/political/ecological project of really exploring the potential productions of consciousness).

Now, if we ask 'What kinds of processes is consciousness involved in?' we tend to think (argh!) of particular kinds of symbolic manipulation, that is, particular kinds of language and particular kinds of logical reasoning. In fact, we are talking about digital processes, that is to say, processes that have the possibility of negation. But this is only a small part of a much wider field of analogic semiotic processes – a field which approximately corresponds to the field of asignifying signs that the *Footprint* editors refer to in the opening question.

Bateson repeatedly pointed out that music, poetry and the creative arts provide practices that involve much more than conscious mind, stating for example that 'in creative art man must experience himself – his total self – as a cybernetic model'.[14] His understanding of aesthetic experience and his later attempts to produce what I think we could call a post-religious conception of 'the sacred' are, I think, a really interesting attempt to make available to modern consciousness an experience of our extended ecological (analogue, asignifying) condition as a relation to our narrower (signifying, digital) conscious condition. On the one hand there is the question of conscious purpose and the relation of consciousness to a particular kind of language that is structured around a subject and object (or subject and predicate) and particular kind of attitude towards objects and environments. In fact, Bateson suggests in the introductory essay to *Steps to an Ecology of Mind* that maybe we produce the form/substance dualism (and implicitly we can extend

that to mind/matter, nature/culture and other dualisms) out of languages that have the subject-predicate structure. It is also worth noting that there are interesting parallels with David Bohm's thoughts on language here. Not all languages have this structure, and Bohm of course played with ideas of a 'rheomode' – a process-based language without nouns – and even connected with some languages (notably Blackfoot) that did not have this structure, while at the 1968 conference on 'Effects of Conscious Purpose on Human Adaptation' Bateson also invited Anatol W. Holt, who had made himself a car bumper sticker which boldly stated 'STAMP OUT NOUNS!'

Returning to the question of an environmental semiotics, we can now approach it from a slightly different direction, using one of Bateson's last papers, 'Men are Grass'.[15] Bateson notes that a 'rational' subject-predicate language tends to have a prose character, and a linear structuring of logical relations, and in its purest mode takes the form of the so-called Barbara syllogism: *Socrates is a man / Men die / Socrates will die*. This is the structure of deductive logic, or rather, it is deductive if you read it top to bottom, and maybe inductive if you read it in the other direction. He suggests that we can formalise another kind of logic, abduction, which is closer to poetic metaphor, and for which he constructs the 'men are grass' syllogism*: Men die / Grass dies / Men are grass*. Here, there are no subject-object relations, just correspondences between predicates, between actions, between verbs. It is a verb-based logic! It is an abductive logic and, crucially, this is the logic that I think might in fact be more useful in thinking about asignifying relations.

Now, if we compare the two syllogisms, we can see that the deductive syllogism identifies subjects and a hierarchy of classes. There is the class of mortals. There is the class of men. And there is the subject Socrates who is in the class of men, which is in the class of mortals. The grass syllogism is very different in kind. It does not identify the classes and

subjects of a sentence. It instead identifies predicates: this thing that dies is equal to this other thing that dies; it is, if you like, a process-based logic. Bateson then goes on to make a fascinating claim, which is that just as the deductive syllogism refers to subjects – it performs a signifying languaging of human conscious subjectivity – in the abductive 'men are grass' syllogism we find a formal model upon which the rest of the human, and indeed the rest of the ecosystem works. Moreover, as an instance of asignifying sympoiesis and biosemiotics, Bateson states that 'metaphor was not just pretty poetry, it was not either good or bad logic, but was in fact the logic on which the biological world had been built, the main characteristic and organising glue of this world of mental process'.[16] It is an extraordinary claim, which sets out two very different structures of relationships with and within environments.[17]

BS: You mention the difference between control and conversation, and I wonder whether we can think of the different structures of relationship with the environment in terms of different attitudes to variety and control. Many writers interpret cybernetics in terms of communication and control – going from the subtitle of Norbert Wiener's book.[18] Like the discussion of communication above, I think cybernetics is interested in control, but it is not necessarily in favour of it; control is something to unpick and critique, it raises cybernetic questions rather than answers them. For instance, we often speak of the variety of the controller and controlled, but in a circular system this is arbitrary (the heater controls the thermostat as well as vice versa). I try to think of the variety of the relationship, which has a different sort of politics to it.

If there is a mismatch in variety between the participants in a system, the participant with the greatest variety will either have its variety reduced (restrictive control) or be out of control to some extent from the perspective of other participants (the relationship lacks coordination, from that perspective at least). Depending on the context, there may

be no problem in either of these. Restrictive control is helpful in driving a car and there can be value in being out of control, for instance when you want to generate new possibilities.[19] But think of a river that has been constrained through engineering to suit human purposes. Sometimes it pushes back, flooding, escaping the constraints that have been put on its variety. We are not usually prepared for this, trusting in our ability to restrict the environment. There are approaches to regulation and coordination that are not restrictive. Glanville used the example of skiing – 'the sort of control that allows us to stay upright when skiing, stable in the face of perturbations'.[20] The point is not that we need to avoid engineering rivers but that there are ways of doing so that accommodate for the variety of the river rather than attempting to reduce it. This approach is to see the river and its ecosystem as a partner.

Another example is when education is thought of as a transfer of knowledge – communication not conversation – and the understanding of the students is restricted to that of the teacher. One of the things I love about architectural education is its potential to be radically different to this. It is the students who prepare for (most) studio teaching sessions, making drawings and models, and tutors take the position of learners, trying to understand what the students have done and respond to this. When it is working well, the students are actually teaching themselves (requisite variety!). The tutors are creating and managing the context in which this is possible by helping manage the variety the students grapple with – adding in ideas and considerations to expand the conversation ('have you thought about this…?', 'tell me more about that…'), making things explicit so that they can be remembered ('do you see what you did there...?'), and acting as constraint and support so the whole thing keeps on track ('don't worry about that yet…', 'you need to rethink this…', 'let me help you with this bit…'). However, the expectation of expertise can be hard to escape. It is easy for conversation to

deteriorate into communication, with the result that students' variety (and that of their work) is reduced to that of their tutors.

Bateson identified three self-reinforcing drivers of the environmental crisis: population, technology, and what he called 'hubris' – our tendency to view the environment and each other as separate to us, and so in terms of competition rather than partnership.[21] Hubris becomes manifest in all sorts of things: the way we bend (straighten) rivers to our will and the way we think of things like education as a linear process of imparting knowledge. We often think of sustainability in architecture in terms of Bateson's first two causes. We build more buildings as the needs of population increase, and this enables further growth. We try to balance this out by reducing the waste and pollution caused by the building industry (technology), reorganising construction processes to be less wasteful and polluting, making buildings more energy efficient and less environmentally destructive. I think architecture has the potential to do more than mitigate the harm it causes; it can also act on our hubris. When we build buildings, we are articulating the relationship we have with the environment. Much of the architecture we build today separates us, reinforcing our hubris in the process. It has been one traditional role of architecture to articulate our relationship with the world and maybe this is a role that can be reinvented for our times.

JG: Architecture both separates and connects, creates interiorities and externalities and these spaces and structures are our extended bodies and our extended minds, individually and collectively. If thinkers like George Lakoff and Mark Johnson are in any way correct in thinking that significant aspects of human signifying languages are always also metaphors of our bodily spatial relations, then there is an important sense in which architecture transforms the possibilities for thinking and languaging.[22] It is a vehicle through which asignifying signs start signifying perhaps. And yes, that curious diagram,

'The Dynamics of Ecological Crisis', that Bateson produces to describe the inter-connection of these three amplifying circuits: population, technology and hubris.[23] From the diagram it is easy to imagine that the three components have a similar structural character, but actually I wonder if they are rather different. The 'population', I think, stands for growth in general, the regenerative and growth tendency of any living system which always has the potential to go into runaway positive feedback. Otherwise they would not maintain themselves at all. However, within any relatively stable and homeostatic ecology, there are negative feedback loops that act to regulate positive loops in any given ecological network. We then have two other loops in that diagram, technology and hubris. Regarding technology, Bateson states that

> what worries me is the addition of modern technology to the old system. Today the purposes of consciousness are implemented by more and more effective machinery, transportation systems, airplanes, weaponry, medicine, pesticides and so forth. Conscious purpose is now empowered to upset the balance of body, of society, and of the biological world around us.[24]

Of the three, the one that he thought that we could change and work on, and the one that I guess he thought that he could contribute some work on, was hubris. This directly connects to what we have been discussing, as this concept of hubris is, as you say, about a certain stance regarding control, which itself is related to the questions of consciousness and language. In fact, I think we can define the hubris here precisely in relation to some of the concepts that we have now set out. Hubris uses the narrow signifying structures of the deductive syllogism alone, whereas an ecological systemic wisdom includes thinking through the asignifying syllogism in grass. It is important to note, I think, that it is not about replacing signifying, deductive reasoning, but rather finding a modern ecological aesthetics

that can play the role that – in some cases at least – poetry, art, religion were able to play in some non-modern cultures, as forms of thought that were able to provide 'a pattern that connects' the loops that purposive conscious reasoning alone breaches.[25]

Therefore, we find ourselves today in a double bind: we need to use our conscious purpose to get us out of the mess that our conscious purpose has fed. And this is a bigger political question of course, as consciousness is socially produced. Which leads back to the editors' opening question in some important ways. We are in an ecological crisis that is in part a product of our non-ecological conscious purpose, of our signifying practices; but the way forward cannot simply be backwards. It is not, I would say, going to be found in a retreat into asignifying practices alone, as some contemporary theorists seem to suggest. Rather, we need to find a way to move through the relation between signifying and asignifying practices, to situate and embody conscious purpose within ecological wisdom. This is very important not just conceptually, but also in response to the kind of ecological planning now being called for in a just response to the climate emergency, in for example the emerging dialogue around a Global Green New Deal. Rather than asking whether architecture might be rid of its linguistic burdens, maybe we can ask: How might a properly environmental architecture extend a scaffolding, and afford metaphors, for a plurivocal ecological conversation that transverses signifying and asignifying registers?

There is a nice example that Bateson uses a few times, which, in his typically oblique way, gives us some useful clues for a more ecological thought and experience, and an understanding of movement between signifying and asignifying signs – a direct experience of metaphors. It concerns the difference in the experience of the eucharist between Catholics and Protestants. Mary Catherine Bateson introduces and then quotes him discussing this at the 1968 conference:

when we wish to explore the relationship between conscious thought and other processes of computation, the deep reasoning of a body or an ecosystem, we need to know the differences in the way they compute. Biological systems in general compute analogically, with pattern, while the conscious mind has access to digital processes, including the possibility of negation … at whatever level it is in your mind that the operators are stored ... at that level there is no not … so that if you represent the Body and Blood with the bread and the wine, that level of your brain is just not concerned with saying that wine is wine … [and] not the Blood. The Catholic view of the sacrament, which asserts an identity between the wine and the Blood, is the way that level of your mind functions. If you become a Protestant and protest that the wine has no corpuscles in it, you are talking, from a Catholic point of view, complete nonsense. On the other hand, you are making a wide statement about the nature of man and about yourself – namely, you are asserting, as a Protestant, 'I am going to handle my religion totally at a conscious level.' This excludes from your religion about three-quarters of yourself, because you aren't all at the conscious level, and you create, in fact, a secular religion.[26]

I am always trying to find ways to teach this kind of ecosystemic thinking, or better still, to ask how can ecosystemic learning happen? Which I think is something that interests many of us. Ben, I know that your deep understanding of Pask's conversational cybernetics has helped to shape an innovative piece of design research thinking in the School of Architecture in Brighton. I have been fortunate to see this emerge while I have been external examiner there, and it really is an interesting piece of work that the students are clearly finding very useful, and which resonates in various ways with some of the things we have said.

BS: I remember Mary Catherine Bateson saying that the time to learn cybernetics is not at university but in kindergarten.[27] It is foundational. When

we come to cybernetics later, as most of us do, it contests our conventional ways of doing things. But, as well as being challenging, I think that focusing on foundational questions can also be accessible. One does not need specific prior knowledge to build on. Instead, one can explore cybernetics within one's own experience and practice. As you mention, I am currently leading a module in design research practices.[28] It is a taught module taken by all our postgraduate students, including those on professional programmes such as our RIBA Part 2 course. I find that design students often see research as something 'other' than their design practice – perhaps as a distinct component or phase of work (site analysis, precedent studies) or as something that happens in the more explicitly academic parts of their study, such as when they write a dissertation. By contrast, from a cybernetic perspective, one can think of research as something that has to be designed, which means that insights from design can contribute to how we understand research practice.[29] I have usually thought of the benefits of this insight as being theoretical – as a way to think of design as a discipline in its own terms while also allowing for rich connections between design and other fields. What I have been trying to develop more recently is a way of using this as a pedagogical approach. In postgraduate study, students are developing their expertise and confidence as designers. By learning to see researching as a kind of designing, students' experience in designing can become a foothold for understanding research through their own practices, which can be empowering.

There are so many ways to do research in design, I do not think it makes sense to teach methods directly. Instead, we stress that the different ways of configuring research processes have consequences for the scope and status of the insights that are created through them. If I am designing my researching, then I need to understand and question the differences that arise from designing research in one way rather than another.

For instance, which standpoint am I researching from and what aspects of the situation does this make it easier or harder to see?[30] In the first weeks we set everyday activities, such as cooking a meal together that no-one in the group has cooked before or choosing a restaurant in a group of people you do not know very well. Because these activities involve new relations and experiences, both about food and about each other, it is possible to locate questions about research and design within these experiences. What did you need to find out? How did you do this? What was it about your source material that made you trust it? Is there a difference between describing this activity as design rather than research or vice versa? What didn't you consider and what difference did this make? The everyday activities create shared experiences that then help situate and internalise questions about method and theory before students move on to examine and critique their own present and past work. Our conversation is making me think of this exercise a bit like the metalogues in *Steps to an Ecology of Mind*, in the way that the rest of the book calls back to insights that were already developed in those conversations. I find myself wondering whether a similar approach might work for other topics. There is certainly a difference between receiving an explanation of how some ecological system works (a communication pedagogy) and coming to understand ecological principles by examining one's own participation in them.

JG: Nice! I think that cooking a meal together in the context of architectural and ecological education, research, and designing research is a beautiful way to 'set forward a relational account that focuses on how "asignifying signs" are produced and exchanged within complex systems of any kind'. Reading back over what has been said, it feels like there is another meta conversation that can now unfold, on top of this one.

Notes

1. Gordon Pask, 'The Limits of Togetherness', in *Information Processing*, ed. Simon H. Lavington (Amsterdam: North Holland Publishing Company, 1980), 999–1012.

2. Pask, 'The Limits of Togetherness', 999.

3. Thomas Fischer and Christiane Herr, eds., *Design Cybernetics: Navigating the New* (Berlin: Springer, 2019).

4. David Bohm, *On Dialogue* (New York: Routledge, 1996).

5. Extinction Rebellion, *Extinction Rebellion People's Assemblies Facilitation Training Manual*, 2019, https://extinctionrebellion.uk/wp-content/uploads/2019/10/XR-PeoplesManual.pdf.

6. Gregory Bateson, *Steps to an Ecology of Mind* (Chicago: University of Chicago Press, 2000), 12–13.

7. Ranulph Glanville, 'Try again. Fail again. Fail better: The Cybernetics in Design And The Design In Cybernetics', in *Kybernetes 36*, no. 9/10 (2007): 1173–206.

8. Gordon Pask, 'Artificial Intelligence: A Preface and A Theory', in *Soft Architecture Machines*, ed. Nicholas Negroponte (Cambridge, MA: The MIT Press, 1975), 8.

9. Delfina Fantini van Ditmar, 'Idiot: Second-Order Cybernetics in the "Smart" Home' (doctoral dissertation, Royal College of Art, 2016), https://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.690638; Delfina Fantini van Ditmar, 'A Circular "Smart" World', in Fischer and Herr, *Design Cybernetics*, 101–17.

10. W. Ross Ashby, *An Introduction to Cybernetics* (London: Chapman & Hall, 1956).

11. Mary Catherine Bateson, *Our Own Metaphor* (Cresskill, NJ: Hampton Press, 2005).

12. Félix Guattari, *The Three Ecologies* (London: Continuum, 2008).

13. Gregory Bateson, *Steps to An Ecology of Mind* (Chicago: University of Chicago Press, 2000), 440.

14. Ibid., 444.

15. Gregory Bateson, *A Sacred Unity: Further Steps to An Ecology of Mind* (New York: Harper Collins, 1991). A very interesting previously unpublished variation of this paper with the title 'Among Wolves and Logicians', which was given by Gregory Bateson at Esalen in May 1980 just weeks before he died, has recently been published, together with a notable commentary on 'Analog and Digital Communication', in chapters 4 and 6 respectively in Philip Guddemi, *Gregory Bateson on Relational Communication: From Octopuses to Nations* (Berlin: Springer, 2020).

16. Bateson, *A Sacred Unity,* 241.

17. It is very interesting to note that some recent eco-feminist thinking – for example Donna Haraway's tentacular relations, and Anna Tsing's fungal thinking – has something like the structure of the syllogism in grass. Also, as an attempt to formalise 'abduction', we should note the relation to the semiotics of C.S. Peirce.

18. Norbert Wiener, *Cybernetics: Or, Control And Communication In The Animal And The Machine* (Cambridge, MA: The MIT Press, 1961).

19. Ranulph Glanville, 'The Value of Being Unmanageable: Variety and Creativity in Cyberspace', in *Netzwerke: Proceedings of Global Village 1997 Conference*, ed. H. Eichmann et al. (Vienna: Falter Verlag, 1997).

20. Ranulph Glanville, 'A (Cybernetic) Musing: Variety and Creativity', in *Cybernetics and Human Knowing 5*, no. 3 (1998): 55–62.

21. Bateson, *Steps to an Ecology of Mind*.

22. George Lakoff and Mark Johnson, *Philosophy in the Flesh* (New York: Basic Books, 1999).

23. Bateson, *Steps to an Ecology of Mind*, 449.

24. Ibid., 440.

25. Gregory Bateson, *Mind and Nature: A Necessary Unity* (Cresskill, NJ: Hampton Press, 2002), 10.

26. Mary Catherine Bateson, *Our Own Metaphor* (Cresskill, NJ: Hampton Press, 2005), 297.

27. Mary Catherine Bateson, 'Living in Cybernetics', in *Living in Cybernetics: 50th Anniversary Conference of the American Society for Cybernetics*, 2014 https://www.youtube.com/watch?v=wpjnVVWXZMs.

28. The initial design of the module was developed by Karin Jaschke and Kate Cheyne. I am particularly grateful to Kristen Bullivant, Jessica Melville-Brown, Sally Sutherland and Jordan Whitewood-Neal, who

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29. Ranulph Glanville, 'Researching Design and Designing Research', in *Design Issues 15*, no. 2 (1999): 80–91.
30. Sandra Harding, 'Objectivity for Sciences from Below', in *Objectivity in Science: New Perspectives from Science and Technology Studies*, ed. Flavia Padovani, Alan Richardson and Jonathan Y. Tsou (Berlin: Springer, 2015), 35–55.

Biography

Dr Jon Goodbun considers architecture in relation to a wider field of systems-theoretic discourses, working in particular with concepts of ecological aesthetics and environmental semiotics that he develops out of the anthropological cybernetics of Gregory Bateson, while also drawing upon three significant contributions from the Marxian tradition concerning cognitive mapping, the production of space and the production of nature. He is currently working on a book entitled *The Ecological Calculus*, and initiating a series of environmental architecture field projects in Greece, where he is now mostly based. He occasionally leads workshops on long-distance train journeys with Derailed Lab. He contributes to programmes at the Bartlett (UCL), University of Westminster, and the Royal College of Art. His co-authored 2014 book *The Design of Scarcity* has recently been translated into German (2018) and Greek (2020). He can be found on twitter @jongoodbun, and at www.rheomode.org

Ben Sweeting teaches architecture and design at the University of Brighton. Ben studied architecture at the University of Cambridge and the Bartlett (UCL). Ben first encountered cybernetics at the latter, going on to use and explore it through the completion of PhD research supervised by Neil Spiller and Ranulph Glanville. Ben is an active member of the American Society for Cybernetics, the British Cybernetics Society, the Systemic Design Association and the International Society for the Systems Sciences. Ben's research interests include ways in which design can contribute to ethics as well as vice versa; rethinking 'place' in the context of systemic crises; historical intersections between architecture and cybernetics in the works of Gordon Pask and Cedric Price; and the development of counter-conventional methodological approaches inspired by cybernetics' original transdisciplinary agenda.