

PATTERNS

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From the Editor:

The late **Stafford Beer**, founder of managerial cybernetics and one of the pioneers and foremost thinkers of the systems approach in general, and management science in particular, once made the wry comment that *the future is not what it used to be*. It doesn't take much to agree with that. Everywhere we look it seems the declared values of the founding fathers of the United States of America have been turned upside down and the effect is felt world-wide. Everywhere we look the natural environment is changing more rapidly and as we become aware of the inter-connectedness of our planet, we know that we are swimming in strange waters.

It is becoming more and more obvious that our traditional linear cause-and-effect thinking doesn't fit anymore. In such a complex world the simple either/or thinking also only adds to the confusion. It is increasingly obvious that this new future (if we are to have one) requires a basic shift in our perceptions and the manner in which we think. The surprising popularity of the film, *What the Bleep do We Know*, seems to stand witness to this growing awareness.

In educated conversation we hear the term, "paradigm shift" often and I am reminded of the (still true) adage that it is "easier said than done." It is easier to talk about the paradigm shift than it is to face the difficulty in being able to actually *do* it.

So we continue publishing **PATTERNS** in the spirit of exploration__in the spirit of invention__experimenting with how the basically changed thinking found in the "New Sciences" can offer us

(continued on next page)

The Theatre of the Body Masculinities: Gender, Art and Popular Culture

By David Wright, PhD.

Abstract:

Antonio Damasio argues that clear distinctions can be drawn between emotion and feeling. Put most simply, he says, "emotions play out in the theatre of the body; feelings play out in the theatre of the mind." (Damasio 2003:28) This suggests that the relationship between the embodied experience of emotion and the social construction and representation of this as feeling is not as direct as it might seem.

Something happens in the translation process. But it is more than a translation process, it is a process of coming to know and incorporate emotional life within social experience. Such knowing is a consequence of feedback processes within which instincts are affirmed, constrained or denied. The discourse on masculinity frequently draws attention to processes through which men limit their feelings. Because this is a social phenomenon it is also a phenomenon of language. Knowing emotion requires language adequate to arrive at that knowing. This is a language of play, creativity and imagination; a language capable of testing the boundaries of previously accepted knowledge systems.

My interest in gender – an issue of personal and cultural embodiment - arises from my own experience and my reflections upon that experience. In this respect, I don't pretend to be a detached observer. I am, as Heinz von Foerster (von Foerster & Poerksen, 2002) would say, a crucial element in the observation. Within my reflective consciousness lies the ethical, value system that identifies and appreciates my knowing. Within this also lies opportunities for the crafting of creative expression.

My embodiment – which incorporates my feeling response to the world - is part of how I know the world. It is crucial to my experience as an instinctive actor and reflective theorist. If knowing is arrived at through embodied consciousness, my ontology is intimately related to, if not determined by, my epistemology and vice versa. This is reinforced by findings in cognitive science, and is especially relevant in discussions around the dramatic encounter. As Joseph Roach (1985) says, "the immediate presence of the body to itself" is among the most startling discoveries of young performers (16). Accordingly, 'what does it feel like?' is one of the questions most frequently asked in drama.

It's a curious recognition, this. While it may long have been the basis of working practices in the arts it is not something anyone can feel altogether comfortable bringing to an academic setting, primarily because the academic world is not especially comfortable with this sort of vulnerability. Admissions of 'the personal body' stand in contrast to the time-honoured valuing of detached rational-

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a changed way of *being* that might assure our viability.

In this new future, humans are now required to take full responsibility for the evolution of life on this planet. As I see it, if we can learn to experience our evolving Selves as *participants*, not merely *observers* on a planet which is an integrated living system, we may just find the necessary balance to survive.

Because, in our public schools we are still thinking and teaching our children that evolution is a natural force that happens "out there," and happens "to" us, we waste energy in conflict with what is seen as the 'opposing faith' in "Creationism." Rather than seeing such orientations as an unsolvable conflict of "realities" that are worth fighting and dying for, we are called upon to practice different, more flexible ways of thinking. **Gregory Bateson** once asked why we speak of humans as "homo faber" when we need also to understand ourselves as "homo metaphora." What patterns we make up with our minds are just as important as the material patterns we make with our hands and, of course, they are connected, for better or for worse. It is this circular connection that we should be helping ourselves and our children to understand.

For me, recognizing the limits to growth on a finite planet, the kaleidoscope is a metaphor for our times. When thinking of paradigm shifts, a kaleidoscope represents multiple possibilities of patterns. We are holding it in our hands and we have a choice to make multiple shifts. I think of this whenever I am asked, "What does Cybernetics mean?" I recall **Heinz Von Foerster**, the father of Second-Order Cybernetics, and his definition of ethics:

"Always try to act so as to increase the number of choices."

Our ability to be flexible in creating living patterns of choice may be key to our survival.

In our lead article, **David Wright** contributes to the profundity of this question of a new future when he

ity. And while such disquiet may be no more than symptoms of a modernist hang-over it continues to generate conflict. A variety of people have written of this. I am drawn particularly to the work of feminists like educationalist Patti Lather (1991), sociologists Susan Krieger (1991) and Laurel Richardson (1997) and anthropologist Ruth Behar (1996). In particular I recall Behar's statement in her book, **The Vulnerable Observer**: "*Anthropology that doesn't break your heart just isn't worth doing anymore.*" (177).

Antonio Damasio (2003) makes very clear distinctions between emotion and feeling. The former he locates in the body, the latter he identifies as a socially constructed response to the embodied experience. "*Emotions play out in the theatre of the body. Feelings play out in the theatre of the mind.*" (28). This play of emotion is a domain within which we interact every day. While it is available to all of us, it is the particular responsibility of arts workers and arts educators to inquire into and become familiar with the dynamics of this 'play' (whilst remaining naïve, in many ways, to the variety of its manifestations).

Emotions play out in the theatre of the body. Feelings play out in the theatre of the mind.

Drama, theatre and performance draw on embodied experience. It is central to actor training and to the relationship between performers and audience. The embodied feeling response prior to emotional consciousness is pivotal. The visceral bursts of excitement – the 'oohs' and 'aahs' – that occur during, for example, the opening ceremony of the Olympic Games are only identified as 'feeling' *after* the event.

It is 'emotion' that artistic directors seek to bring about; likewise, the staged political forum, the tremulous build up to the first performance of a new play and the sombre ceremonial remembrances of a remembrance day. All are structured to bring the body to a form of knowing. The 'shiver up the spine', the 'weakness at the knees', the 'lump in the throat', the 'tear in the eye', the 'swelling in the heart', the 'stirring in the loins', the 'wrinkling of the brow' no less so.

Because culture is, at least initially, a field of *emotion*, and drama, theatre and performance methodologies are for the generation of *feeling*, the feeling, (the personal embodied experience of gender), is also an issue. Whether it is as subject matter or problem or simply presence, gender is inescapable. In this respect it is worth pointing out that men dominate the business of film, television and theatrical production. In addition the principal roles in film, television and theatre are predominantly male, but the majority of students who enroll in and graduate from education programs in Acting are female.¹ Between 1990 and 2003 the University of Western Sydney (UWS) graduated 267 students from its Acting program. Of the 267, 168 were female and 99 male. If tertiary training is solely a form of vocational training, one might assume that these female students are poorly informed, idealists or fantasists. If tertiary education is about following up an instinctive, or even a considered, response to a form of specialised knowledge it would seem other factors may be at work. It is here that I want to introduce the issue of emotion and vulnerability to feeling and suggest that perhaps there is a greater preparedness – or even a greater desire – among young women than young men to encounter the vulnerabilities that arise in and through the study of performance.

In a paper of this kind a researcher could set about testing the proposition that 'vulnerability' has a relationship to enrolment patterns. It is not exactly what I want to do here. Instead I want to work with the assumption that this relationship exists, then query the experience of vulnerability and the intimidation contained therein.

Masculinity is largely known through assumptions, constructions and accounts. These have their origins in personal reports of personal encounters. It is also known through difficulties in interpreting and communicating such encounters. Jonathan Rutherford (1992) discusses this at length as he argues the lack of a male 'language of feeling'. Consequences of this include, Rutherford says, incoherence and silence. He discusses these silences through reference to Raymond Williams 'structure of

feelings': a system Williams devised to discuss "what is not fully articulated, all that comes through as disturbance, tension, blockage, emotional trouble", which precedes practical expression and knowing". (11) That such feelings do not find their way into verbal exchange does not mean however that they are not encountered or communicated.

A central lesson of drama is that body language over-rides verbal language. This has been a tenet of actor training since Stanislavsky. Moreover, acting is taught through a craft tradition. Oral and embodied discourses are vital to its communication. In such teaching, silence, like absence, is a dramatic tool. In the theatre it is experimented with constantly. Augusto Boal (1992) argues that a direct consequence of this is that actors are very conscious they are using embodied languages, "and are thus better able to turn ... (them) to their advantage." (xxx) Yet, in terms of seeking training to facilitate such understanding – for such training is not widespread beyond performance (and associated growth and therapeutic trainings) – evidence suggests that men recognise and value this less than women. It is arguable that this is more than an issue of vulnerability. It is also an issue of awareness and skill development. But vulnerability cannot be set aside. In theatre there is an essential relationship between vulnerability and dramatic truth and vulnerability and skill in performance. Arriving at such vulnerability is the process that challenges drama students most. First there must be a need to realise, then there needs to be a strategy for its accomplishment.

While process is central to all creative practices drama is undertaken in relationship in a way that the others – with the sometime exception of music - are not. Drama ensembles are powerful vehicles for the interpretation of experience. The collective consciousness of those involved is a mass of methodology and learning. It's learning is different to the learning involved in solo work. There is firstly, the chance to talk about it and secondly, the collective (embodied) consciousness that arises in and remains after the event. Drama is, in this regard a refined form of collective inquiry as much as it is a means for the delivery of product. The process is not a means to a predefined goal but it is one that can be identified and appreciated, which has collective and individual aspects, and which can be worked with systematically and strategically. But first it is necessary to discuss the need to know, for in this need lies much of the challenge of adult masculinity. When symbolic ritual is no longer used to mark life's transitions, change is confronted differently.

*I encounter the world through emotion.
It is a contributor to my 'ecology of mind'.*

There is considerable literature on the personal transitions of men. Much of this is transition through suffering: for example melancholia (Smith 1999), paralysis (Kriegel 1998) and cancer (Franks 1995). In *The Wounded Storyteller*, Arthur Franks writes of the importance of story in such transitions. In doing so he writes of the relationship between suffering, creative practice and transformation. In anthropology and performance anthropology, transformation is discussed in relation to 'liminality' (Turner 1982). This is the space out of which new understanding grows. It is for example, initiation: that which a boy goes into and a man emerges from, knowing he is a man. *It is through such knowing that Damasio's emotion is transformed into feeling and it is through feeling that experience of the world is transformed. Creative rendering is an opportunity for the generation of such knowing.* Such rendering may or may not have an audience. It is nevertheless a process that draws upon a deep desire to realise – and its consequent knowledge may be offered up in a variety of forms. Clearly, the mind is known and represented through a variety of means.

On a phenomenological level, when I am captured by grief, the world around me is determined for me, to an extent, by my grief. When I am captured by contentment or happiness or elation, the world around me is determined for me, to an extent, by that too. I encounter the world through emotion. It is a contributor to my 'ecology of mind'. It is arguable therefore that emotion deserves to be understood as something

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speaks of the relationship between "the embodied experience of emotion and the social construction and representation of this as feeling." He cites the discourse on masculinity which draws attention to processes through which men limit their feelings and thus the ability to socially construct a language of feelings.

He suggests the importance of training in the theatre arts, "a language of play, creativity and imagination; a language capable of testing the boundaries of previously accepted knowledge systems" As we see it, this knowledge system embedded in a society dominated by the masculine perspective is based on an *inhibited* expression of feelings. This society exhibits a tendency to emotional dominance – a quality connected with the belief in the survival of the fittest.

Wright cites **Humberto Maturana and Francisco Varela** who argue that we live our lives 'in emotion' and that "our ongoing 'emotioning' is integral to our participation in the world through which we 'know'."

We can understand the present social and political turmoil better when we consider how we frame our "realities" by "interweaving experience and explanation ('emotioning' and 'linguaging') in a conversation through which we 'bring forth our world' – the world and the future we enter constantly."

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We explore the power of metaphor in our review of the book, *Don't Think of an Elephant!* by **George Lakoff**, Professor of Cognitive Science and Linguistics at the University of California, Berkeley. In our review on p. 6, we see how 'the nation-as-a-person' meta-

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phor illustrates how pervasively powerful metaphors can be in our present political system.

"Just as it is in the interest of a person to be healthy and strong, so it is in the interest of a nation-person to be economically healthy and militarily strong. That is what is meant by "the national interest"

It is through such use of metaphor that we can understand how we view some nations as children who need the guidance of the strong father. We can see how the paradoxical notion of 'fighting a war for peace' can fit within a family of nation-persons metaphor if we also accept a strict father metaphor.

As Lakoff comments,
"Metaphors can kill."

We have included an exercise on metaphor-making contributed by **H B Gelatt** and his partner **Carol Gelatt**. For nearly 40 years H B Gelatt has been regarded as an expert in decision making. Most notably he is the creator of *Positive Uncertainty*, a philosophy of decision making in uncertain times.

A sustainable future will require a radically different educational system. **Frank Galuszka**, Professor of Art at the University of California in Santa Cruz, (see PATTERNS May 2002), reviews an important book. **Ecological Thinking: A New Approach to Educational Change** by **Shoshana Keiny**, explores a way of thinking that focuses on the dynamics of context rather than on a curriculum which generates hierarchy. It focuses on learners rather than on data.

Galuszka, past president of the *American Society of Cybernetics*, writes; *"The educational projects and this book are true to second-order cybernetics."* Of special interest is that she writes within the socio-political complexities of contemporary Israel.

different to a temporary divergence from tranquillity, if only because tranquillity is itself a felt encounter. In this respect Maturana (1994) argues that we live our lives 'in emotion' and that our ongoing 'emotioning' is integral to our participation in the world through which we 'know'. It is within this inter-weaving of experience and explanation ('emotioning' and 'languaging') that the congruence will be found that constructs both learning and the environment for learning. Maturana and Varela (1987) refer to this inter-weaving or 'braiding' of mood and explanation as a form of 'conversation'. They describe it as the means whereby we 'bring forth our world' – the world and the future we enter constantly.

Participation constructs a form of conditional knowledge. In this respect notions of author-ity need to be contested so that participants can develop forms of explanation appropriate to their unfolding. These have their basis in a feeling response to experience. They require a form of listening and sensitivity akin to that called up in actor training via the body-based improvisation, play and character work that occurs within it. Greater recognition of this may provide greater opportunities for men, to make sense of their participation. But it is not simply a matter of 'men coming to their senses' and 'men realising what is good for them'. Creative work is a deeply sensed negotiation between experience and the recall, consideration and documentation of experience. It is a methodology that educators need to make accessible to those who might otherwise stand to one side.

*Our ongoing 'emotioning' is integral
to our participation in the world
through which we 'know'.*

Brazilian theatre director Augusto Boal (1979, 1992, 1995) has developed dramatic processes that work in such ways. These are structured activities that tap into personal feelings, which are interpreted in political terms. Ostensibly, their function is neither artistic nor therapeutic nor even educational (though they are of course all these things). Boal identifies the games as means for analysing and overcoming oppression. Central to this overcoming is an understanding Boal offers via the term 'spect-actor'. The term contains and defines theatre, which is, according to Boal "the art of looking at ourselves" (Boal 1992: xxx). "Theatre is born when the human being discovers that it can observe itself; when it discovers that, in this act of seeing, it can see itself – see itself in situ: see itself seeing. (Boal 1995: 13)

Boal's 'theatre of the oppressed' is a pedagogical encounter with embodied and emotional experience. Boal addresses the emotional experience of oppression, in a theatrical context, through games designed to challenge the embodied consequences of that oppression. The games are the overcoming of the oppression as distinct from the performance of the overcoming. The practice can be and has been applied to a variety of settings, from drama classrooms in Australia to villages in rural Iran, where traditional power relationships undermine reform. Boal describes these games as forms of "physical reflection on oneself". "The games" he says, "deal with the expressivity of the body as emitter and receiver of messages" (Boal 1992: 60). It is in the body that such knowledge is found. Accordingly, he offers invitations "to feel what we touch", "to listen to what we hear" and "to see what we look at". Importantly, these invitations are to understand oppression through the body and through emotion. The more common method - that traditionally favoured in our society by men - is to communicate *about* oppression, *about* the body and *about* emotion. The personal, as distinct from disengaged, encounter with the body of emotion can be profound. This encounter can be extended through a variety of forms of relationship: the relationship with the self, the other, the environment and abstract knowledge, ideas, concepts and culture. Within relationship lies the opportunity to recognise and act as a consequence of that recognition. Sustainability is not pursued in isolation. In my experience these games provide opportunities for reluctant males to enter into this form of embodied knowing.

The conversation about embodiment, emotion and vulnerability is rich and far

reaching. 'My' involvement in this intrigues me as much as the subject matter. I find it impossible to separate the two. This implies a relationship, which brings with it responsibility. 'I' am now complicit and I have a role in creating the ongoing meaning in which 'I' am participating. This is not solipsism. It is grounded in principles of relativity. By admitting my own participation in the relationship I take responsibility. I am ethically bound. In Heinz von Foerster's words, "it is no longer possible to find an excuse ... by referring to an external reality" (von Foerster & Poerksen 2002: 30).

I place my 'objectivity' in parentheses, as Maturana would say, (<http://www.enolagaia.com/EA.html#O>) and regard it as conditional rather than absolute. My vulnerability is that of the man who embraces the opportunity contained in creative experience and in the process encounters the dual aspects of spect-actor.

The significant gender imbalance in acting courses must be a consequence of more than social forces. Issues of personal vulnerability and sustainability may be extremely significant. These are encountered as young men experience emotions they find difficult to feel. The expression of feeling, which is central to the form of self-consciousness arising from self-reflection that enables accomplishment in the creative arts, is not easily accessed. Such access is a consequence of more than encounters with supportive others. It is a consequence also of linguistic models and structures that enable opportunities for the knowing of emotion and the expression of that knowing. This entails the search for a vocabulary as much as it does the search for a form. Some structures, vocabularies and methodologies facilitate this better than others. I argue that greater use of structured creative opportunities will arrive through a greater capacity to dive into, explore and experiment with the means whereby we communicate.

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<http://www.enolagaia.com/EA.html#O> accessed 22/05/04

Note 1. *The Acting program accepts only about 25 auditioned students each year (often over 300 audition). Within these constraints staff also try to ensure a gender balance. The number of male graduates exceeded those of females in only one year: 1990. Currently, there are 180 students in the three years of the UWS Bachelor of Performance, Theory and Practice (with strands in Acting, Dance and Theatremaking); 128 of those enrolled are female, only 52 are male.*

It is sad that we must look to the past to find an example of "ecological" thinking in higher education. **Stuart Umpleby** of the Research Program in Social and Organizational Learning, George Washington University, describes the **Biological Computer Laboratory (BCL)** which operated from 1958 to 1975 at the University of Illinois in Urbana-Champaign, directed by **Heinz von Foerster**.

BCL was unique in the attention paid in a scientific research laboratory to the visual and performing arts. Umpleby writes, "*The effect of combining mathematics, science, and art was to stimulate analogical and metaphorical reasoning. By looking at examples in very different fields, students could appreciate the very general nature of the circular and self-referential phenomena being considered.*"

On p.15, we have included an excerpt from the Washington Center for Complexity and Public Policy titled, *Helping Educators Develop New Ways of Thinking about Education*.

Irene Sanders, executive director of the center, points out that **Education Secretary Paige** "recognized the potential benefits of complexity science as a new framework for thinking about education within a futures context." The center's advocacy of complexity science indicates the growing popularity of "New Science" thinking in governmental circles and thus raises a red flag in my mind.

Sanders comments about the usefulness in developing "intuitive, associative forms of pattern recognition to respond to problems" and, "*to see and influence them before a crisis arises....The new science (is) so relevant to government at all levels.*"

The Washington Center is in the forefront of "applying this new way of thinking to public policy." The center is offering a new workshop for the intelligence community, titled, **Strategic Intelligence Analysis in a Complex World**.

don't think of an elephant!
Know Your Values and
Frame the Debate.

by George Lakoff
Chelsea Green Publishing
White River Junction, VT. 2004
ISBN 1-931498-71-7 (paperback)
Reviewed by Barbara Vogl

Don Hazen, executive editor of AlterNet.org, writes in the Introduction that, "*Not long ago, George Lakoff was relatively unknown. He was famous in academic circles and favored by a small group of progressive and media insiders, who grasped the implications of his genius.*" As Professor of Cognitive Science and Linguistics at the University of California at Berkeley, he has, since the mid 1980s, been applying cognitive linguistics to the study of the framing of public political debate. His insights have grown in popularity, giving guidance in our present political environment.

He speaks of *Frames* as mental structures that shape the way we see the world. They are part of the structures in our brains that "we cannot consciously access, but know by their consequences; the way we reason and what counts for common sense." We also know frames through language so when you hear a word, its frame is activated in your brain.

Reframing is changing the way we see the world and this requires a new language, a different way of speaking. The manipulation of frames has become a political art and in a democratic society we are required to be aware of how this is done.

This book is a short practical guide to understanding our puzzling political discourse. *One of the fundamental findings is that all people think in terms of frames and metaphors. "The frames are in the synapses of our brains, physically present in the form of neural circuitry. When the facts don't fit the frames, the frames are kept and the facts ignored."*

Ecological Thinking: A New Approach to Educational Change

By Shoshana Keiny

University Press of America
Lanham, New York, Oxford 2002
ISBN 0-7618-2401-4 (paperback)

Reviewed by Frank Galuszka, Ph.D.

Primary and secondary school education seems to have been in crisis for as long as most of us can remember. Shoshana Keiny explains why: "The massive social changes that have taken place over the last fifty years and which have affected almost every aspect of our lives (such as, work patterns, residential stability, sexual habits, dress, language, music, etc.) have not been matched by new thinking in education," Ecological Thinking is her remedy for this situation. It is an approach to thinking within an educational system, a way of thinking that focuses on an understanding of the dynamics of context rather than from a curriculum-generating hierarchy. Ecological thinking focuses on learners rather than on data. It regards the source of learning as through cooperative interaction within a 'community of learners', rather than from a teacher who stands outside of a collection of isolated students.

Those of us who teach, as well as those of us who send our children to school, understand how and why education fails to keep up with lived change. The culture is now moving faster than any content-oriented strategy can pace. Things not only have changed, but they continue to change and can be expected to continue to change further. Keiny notices that while content adjusts as society makes new discoveries and reprioritizes old ones, change itself does not change, but displays some enduring characteristics that can be felt, learned and understood by participants. Further, there are other things that do not change: conversation, human relationship and mutual responsibility, for instance.

*The culture is now moving faster than
any content-oriented strategy can pace.*

Dr. Keiny describes a history of case studies carried out in schools within small desert communities in the Negev desert. These schools are within the Israeli school system. This educational system is a hierarchy with researchers at the top. These researchers determine content. Below them, curriculum developers translate this content into curricula. Finally teachers teach curricular content to students who are expected to receive. This is not only a slow and cumbersome process, but it is slowed down further by the time it takes for researchers to detect, validate and analyze emergent content. It is also slowed by the time it takes to overcome resistance to change, including a change in content, throughout a hierarchy in which knowledge and identity (of teachers, administrators, researchers, politicians, special interest groups, students, student's parents) are intertwined into structures that seek after permanence rather than continuous openness to change.

In the educational projects described in Ecological Thinking, Keiny's emphasis is on the process, on the interplay between theory and practice. Each project is driven by a focal research question, which is viewed both as authentic and meaningful by the participants who have identified it. Within a collaborative setting, the participants indulge in research or in data collection and in reflection on their findings. As a result, new understanding is achieved, with a wider view, encompassing more complexity.

Tacitly if not directly, Keiny's educational projects challenge the hierarchy. It is not surprising that she chronicles resistance to change among administrators and parents, but she also finds that, as teachers learn to pedagogically operationalize the idea of learner-centered education, this proves to be quite difficult. The resistances are

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The American Society for Cybernetics

www.asc-cybernetics.org

Stuart Umpleby, of the Research Program in Social and Organizational Learning, George Washington University, Washington, DC, sends this information concerning the republication of the book **Cybernetics of Cybernetics**.

"Recently I talked with Steve Carlton who republished Cybernetics of Cybernetics a few years ago. Heinz and a group of students originally published this book in 1974. It is a remarkable volume. Steve has quite a few copies left that he would like to sell in order to lower storage costs.. Attached is an abstract for a paper I am currently writing. The paper will be an explanation of the creation of the book and why I think it is an example of a highly innovative research program."

--Contact: Steve Carlton <scarlton@attglobal.net> to obtain copies of the flyer and display copies.

The Biological Computer Laboratory

One way to evaluate the success of a research center is by how often its work is cited after the center closes. By this standard the Biological Computer Laboratory (BCL) at the University of Illinois in Urbana-Champaign was an outstanding success. BCL operated from 1958 to 1975 under 25 grants and produced 256 articles and books, 14 masters theses and 28 doctoral dissertations in the fields of epistemology, logic, neurophysiology, theory of computing, electronic music and automated instruction. (Biological Computer Laboratory, 2004). Thirty years after it closed, its work is increasingly cited in publications in several countries. The director of BCL was Heinz von Foerster, an immigrant from Austria. What did von Foerster do to create and sustain such a highly productive research team? We describe several features of BCL and the courses that von Foerster taught. They are similar to the points made in the literature review above.

Interdisciplinary Research

The research at BCL was an extension of the Macy Foundation meetings that were held in the late 1940s and early 1950s on the subject of "circular causal and feedback mechanisms in biological and social systems." (Heims, 1991). Accordingly, the research agenda at BCL included control and communication processes in any field. The result was a highly interdisciplinary group of faculty members and students. They came from engineering, the biological sciences, mathematics, music, and the social sciences.

Art and Analogical Reasoning

BCL was unique in the attention paid in a scientific research laboratory to the visual and performing arts. This orientation seemed to be the result of von Foerster's upbringing in the artistic community in Vienna between the two world wars. The effect of combining mathematics, science, and art was to stimulate analogical and metaphorical reasoning. By looking at examples in very different fields, students could appreciate the very general nature of the circular and self-referential phenomena being considered.

Many Modes of Learning

The literature on learning styles suggests that some people learn primarily from reading, some primarily from listening, some primarily from working with their hands, and some primarily by working with other people. BCL used all modes of learning. There were people building various kinds of electronic devices, people doing mathematics, music composition and dance, and the usual academic work of lecturing and writing and publishing papers. As one example, the construction of the book *Cybernetics of Cybernetics* in 1974 employed all learning styles and the book itself makes possible the use of most learning styles. (Von Foerster, 1974)

Involvement of People at Several Levels of Education

Von Foerster's classes were always about some new area of research, for example bionics, heuristics or cybernetics of cybernetics. The class was a learning exercise for all concerned -- faculty as well as students. As a result the class attracted participation from people at many levels -- undergraduates, graduate students, post-docs, and faculty members. The students usually did literature searches and worked on producing the final document. Graduate students and post docs explained basic concepts to the undergraduates. The faculty gave purpose to the enterprise by describing the historical context of the new ideas and explaining the significance of the current research.

A Large and Grand Vision

The goal of von Foerster's research was to include the observer in the scientific enterprise. This goal required a fundamental change in the philosophy of science. But the appropriateness and reasonableness of the idea was readily apparent to anyone who had encountered cultural differences. Nevertheless, most of the research at BCL approached the task through neurophysiology and mathematics. The work at BCL was aimed not at making an argument for a plausible idea but rather at constructing a scientific proof for the necessity of including the observer based on an improved understanding of the nature of cognition. Hence, the idea was to transform the philosophy of science, and assumptions about human relationships, by doing leading edge

research in biophysics, engineering, and communications.

Support and Encouragement for All Contributions

Von Foerster believed in the self-evaluation of learning. Students were invited to suggest the grade they should receive based on how much they felt they had learned in the course. All contributions, no matter how strange or unusual, were greeted with a smile and praise. Ideas were evaluated through a sense of play rather than whether they were "correct." Since all ideas revealed something about an observer and all observers were "legitimate," all ideas were part of an on-going conversation. Each expression of an idea was an opportunity to adjust the conversation to the needs of the participants. If some people needed background information, for example in a discipline other than their own, someone would meet with that person or persons after class. The purpose of the course was to invent new ideas or interpretations rather than to communicate accurately already accepted ideas.

Furthermore, von Foerster maintained that there are two kinds of questions – legitimate questions and illegitimate questions. Legitimate questions are questions to which answers are NOT known. Illegitimate questions are questions to which the answers ARE known, for example the questions in textbooks. Von Foerster's classes were aimed at answering legitimate questions.

Social Activities

At least once or twice a year Heinz and Mai von Foerster would invite the "friends of BCL" to their home for an evening. These occasions, which were delightfully lively with von Foerster as master of ceremonies, were very helpful in promoting informal communication among the students and researchers in BCL. The office itself was also a place of activity, excitement, and friendliness with people engaged in tasks ranging from engineering to graphic arts and with blackboards filled with diagrams and mathematics.

Transparent Information

As a student, one of the features of BCL that the first author most appreciated was how easy it was to find out what was going on there. The secret to information sharing was remarkably simple. In the front office where the receptionist's desk was, von Foerster had put a board on top of a radiator. On the board were small stacks of recent publications. From time to time while walking across campus, the first author would make a slight deviation from his usual path and pass through the front office of BCL. He would look at the papers on the board on the radiator and take a copy of those that looked interesting. If there was something in a paper that he did not understand, he would ask someone for an explanation.

Research on Several Levels

One feature of von Foerster's classes that made them much more interesting than the usual class is that they involved questions on several levels – practice, theory, and philosophy. For example, machines built in BCL to demonstrate some aspect of perception, would inform theories of cognition, which would be used to question propositions in the philosophy of science. In the early 1970s Stafford Beer (1974) published Platform for Change which uses different colored paper for explanations at different levels of analysis. After reading this book, von Foerster gave a lecture in which he used different colored cards hanging around his neck to indicate the level of analysis of the different parts of his lecture. The first author found it surprising how often he had to change the card that was visible.

*The class was a learning exercise for all concerned
-- faculty as well as students.*

As this description indicates, von Foerster's style of teaching was different in many ways from the usual required and elective courses. Occasionally people ask how he got away with offering such unusual courses. Occasionally he had to smooth some ruffled feathers among administrators and once he was summoned to the state capital in Springfield, Illinois, to answer questions by legislators. But usually there were few problems. The courses were offered as "special projects courses." Students could receive either undergraduate or graduate credit. The courses were offered only one semester. Each semester there would be a new course on a new topic. Most universities in the US now have "special projects courses." But they are usually used to develop new courses for the catalogue rather than to conduct research by a group of faculty members and students.

A Different Approach to Conferences

After BCL closed in 1975 conversations among the previous members of BCL continued both on-line (Umpleby, 1979, 1983) and at meetings of the Society for General Systems Research in the late 1970s and the American Society for Cybernetics in the 1980s and 1990s.

Von Foerster's approach to conferences was also quite different from the usual academic conference. Most academic conferences consist of carefully scheduled presentations of research results with a discussion following each presentation. Von Foerster's idea of a conference was more like a conversation among friends who do not often see each other. His presentations were intended to arouse interest, raise questions, and create doubts about current beliefs. He did this by presenting research results about perception or cognition which challenged prevailing assumptions.

The purpose of the conference then was to use the gathering of people to raise new questions, to create new understandings, and to define new directions for research.

Conclusions: Research and innovation have a profound impact on organizations and society. High performance research teams

The 2004 Conference of the American Society for Cybernetics was held from August 4-8 with the collaboration of the Department of Image Arts of Ryerson University in Toronto.

The Conference held its Annual General Meeting, and a memorial hour to mark the recent passing of several of our pioneers and members. We enjoyed a good mix of presentations: three keynotes, a performance and twenty two sessions.

Ranulph Glanville spoke on 'Control, Imagination and Addiction'

Pille Bunnell spoke on 'The Biology of Astrology'

Klaus Krippendorff spoke on 'Space and the Furniture of Cyberspace'.

All of the evenings and most of the other sessions were audio-recorded. This did not capture the visuals.

Submitted by:

Allenna Leonard, President

(Continued from P. 9)

can contribute greatly to the competitive position of their organizations and to societal progress. These teams are characterized by skilled collaborative team members willing to work with people of different styles and cultures with mutual respect. They operate in a collaborative environment with committed senior executive support, and effectively using facilitation processes. As we learn more about how to effectively organize and support research activities, how to collaborate among various types of organizations, and how to create innovative research teams, the rate of innovation can be expected to continue to rise.

Stuart Umpleby, Resesarch Program in Social and Organizational Learning, The George Washington University, Washington, DC 20052,

<http://www.gwu.edu/~umpleby>

Fear Requires Certainty:

Love Opens to Uncertainty and a Space for Wonder and Joy:

The Ethics of Heinz von Foerster's Invitation to Dance

by Robert Martin

When I choose to believe that I invent our world, I give up belief in an objective reality I can count on. I enter a scary territory where the ground is no longer solid. When the world was an objective reality, it didn't need me. The world I invent needs me to invent it. I embrace the words of Gerard Manly Hopkins: What I do is me; for that I came!

If I invent my world, then so do you. To have a world we want, we can cooperate. Heinz valued conversation so much because it gives us a chance to share our perceptions, our worlds. I find this a beautiful thought. We can only understand our many worlds through conversation rooted in love—rooted in love because only love enables us to cast aside fear and make room for the other in our world. Fear triggers protective responses—to fight, to close down, to flee, closing off learning and invention and problem solving.

Fear feeds on itself. Feed a fear, a bigger fear grows up. The middle ages spoke of the seven deadly sins. What makes them so deadly is that they devour whoever is in their grip. No matter how much they promise, too much is never enough. Greed can never be satisfied; if you are greedy you can never have enough.

Malvina Reynolds wrote a song which celebrates the alternative to greed:

Love is something, if you give it away,
you end up having more.

It's just like a magic penny,
hold it tight and you won't have any.
Lend it, spend it and you'll have so many
they'll roll all over the floor, for

Love is something, if you give it away,
you end up having more.

If we give up objectivity, we have the opportunity to get back love and wonder. We have (perhaps rare) experiences of love and wonder where fear drops away and we need no certainty other than the experience itself. We all have these experiences. Heinz simply invites us to go at them from the other direction: to give up the belief in objectivity and then, when the ground no longer feels solid under our feet, to dance with one another, for we need one another to invent a world in which we can all live. I find this a comforting thought, a joyful experience.

And what is love? Each of us, each creature, has his/her/it's own way of living. Love is the willingness to understand, respect and even embrace the other, and the willingness to interact with the other in a way that does not destroy the other's way of being in the world.

We can live in heaven or in hell. In the words of William Blake, we can make a hell of heaven (Los Angeles became a huge city because it's climate and location resembled heaven to its early inhabitants) or a heaven of hell. We and those around us choose to invent heaven and hell—and then to live in them. The story which best illustrates this for me goes as follows: A mighty warrior, eager for knowledge of heaven and hell, approaches a zen monk and asks, "What is heaven? What is hell?" The monk thinks. The warrior grows impatient and the monk finally looks up, shakes his head, and says, "I can't tell you; it would take too long; besides you wouldn't understand, you're too stupid." The warrior rises,

(continued on next page)

every fiber of his body quivering with rage, takes out his sword and shouts, "Prepare to die for your insolence!" The monk holds up his hand to stay the warrior, and says simply, "That is hell." The warrior stops, reflects, begins to understand and smiles, and laughs. The monk raises the other hand and says, "That is heaven."

And what about ethics? Heinz says that ethics is always implicit in our behavior. We don't have a choice about inventing the world in which we live. Our choice is whether to take responsibility for it, and in doing so, moving away from a world in which we don't want to live and toward a world in which we do want to live. I reflect in the hope of choosing well.

Robert Martin is Membership Chair of ASC. He teaches at Truman State University, Division of Education, Kirksville, MO

**Wanted: Site and Date
for 2005
ASC Conference.**

The ASC is looking for a site sponsor and theme for the 2005 Conference. Site needs are a meeting room, registration/reception space, nearby facilities for eating and sleeping.

Conferences are planned to break even and there is a small kitty carried over to provide for pre-registration expenses for the next conference.

Help is available from the ASC Executive and other volunteers but someone is needed to be liaison with the site and to provide accomodation connections.

Provisions have been made for on-line registration.

*Please contact:
allenna_leonard@yahoo.com.*

**2005 MEMBERSHIP
RENEWAL
for The American Society for Cybernetics**

Please renew your membership for 2005 if you have not already done so! We're now doing all our renewals on line (though you can still pay by check as well as credit card). You can renew by going on-line to the ASC website <http://www.asc-cybernetics.org>

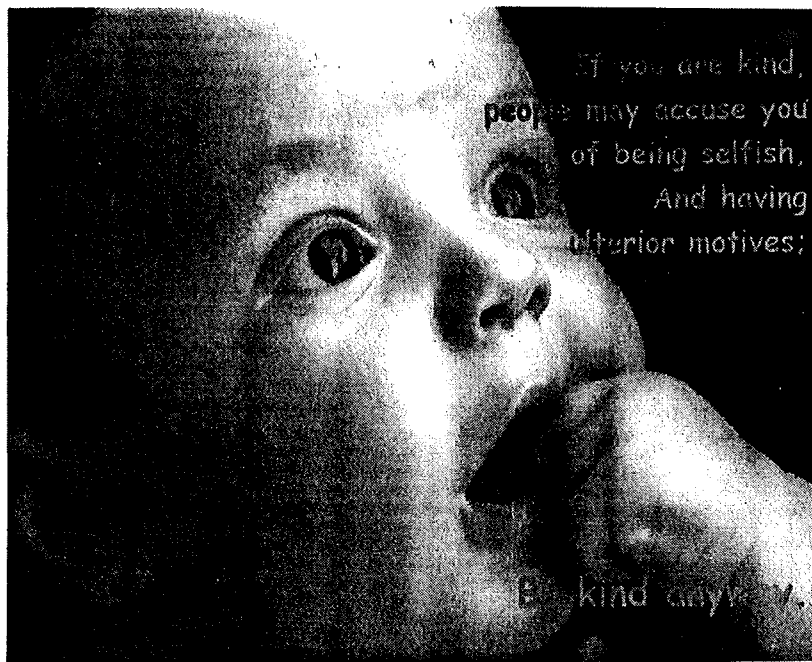
Click on CONTACT INFO which takes you to the contact page. Click on "click to renew/join" and you will be taken to the SPORG.com site for membership renewal. This is a secure site.

If you wish to go directly to the renewal site, for efficient and secure membership registration / renewals:

https://www.sporg.com/Ind/Registration?cmd=link_to_form&id=8623&view_type=windowed

If you have any difficulties, write to Robert Martin, ASC secretary, at rmartin@truman.edu and you will be mailed the link you need to go directly to the renewal site.

Do you know about <<http://www.meetup.com>> ? It is a way of creating local groups with similar interests for face-to-face meetings. I entered "cybernetics" and found 17 groups worldwide with 67 members. The largest is in NYC with 4 members. Some cities have only 1 member. But this is more than I expected. Perhaps we could send an email to our members suggesting that meetup.com might help them organize a local chapter and find new members.



continued from p. 6

In the case of the destruction of the twin towers, we are not consciously aware of the metaphorical images, but they are part of the power and the horror when we see them. We have, in the premotor cortex of our brains, what are called mirror neurons. There are connections from that part of the brain to the emotional centers. If we evoke the metaphor of the buildings as person, or as a society, or a temple then we sense__again unconsciously but powerfully__ that *we* are falling, or *our nation* is threatened, or *our religion* is destroyed. "*Our systems of metaphorical thought, interacting with our mirror neuron systems, turn external literal horrors into felt metaphorical horrors.*" This helps us understand how, seemingly unquestionably, we were led into a "war on terror" in response to this event.

Lakoff's years of research with environmental and political leaders have been distilled into this essential guide, which shows progressives how to think in terms of values instead of programs, and why people vote their values and identities, often against their best interests.

This book is written for all of us__thinking conservatives and progressives alike__who sense that something is badly awry and want to do something about the state of our nation and the world. The earlier chapters are meant to explain who we are. They are also meant to make explicit what is usually felt but not articulated. There is an introduction to framing__what mistakes to avoid and how to reframe, with examples of how framing works.

Of interest also, is the Publisher, Chelsea Green of White River Junction, Vermont, who is committed to being a sustainable business enterprise as well as publisher of books on politics and practice of sustainability. This book is printed on a 100% post-consumer waste recycled, old growth forest-free paper supplied by Webcom. They can be reached at 802-295-6300 The website is:

<www.chelseagreen.com>

Metaphors of the Future

By H B Gelatt and Carol Gelatt

If your vision and future image are important, you should know what they are. Knowing, however, involves two parts of your mind: conscious and unconscious, rational and intuitive, cognitive and imagery. Most people are more familiar with one part or the other. Most people are either left- or right-brained. One way to bridge this gap between the two minds, to find out about your future vision or to develop it, is with metaphor.

A metaphor calls a thing something it isn't: "Life is a bowl of cherries." Metaphors are not logical, but they create an image that can challenge what is blindly accepted, allow new links to develop and generate new ways of thinking. Metaphors are a way of understanding a situation you are a part of and helped create. They give you a new language, a more poetic, less scientific language, for discussion of life.

Your life is like a metaphor. Sometimes you can understand it, sometimes you can't. Sometimes it is sad, sometimes funny. Sometimes it just doesn't seem complete, yet at other times it may seem perfect. In many cases it appears that there must be more learning to it; and the more you think about it, the more you understand it.

The following two-part metaphor activity, adapted from Draper Kaufmann, *Teaching the Future*, will help you get acquainted with your future vision. Read the four metaphors and decide which one comes closest to your future vision. Assume this is a multiple-choice, forced-choice decision; you must choose one. It may not be exactly right, but it is better than the others.

Which Metaphor Fits You?

1. *Roller Coaster*

The future is a great roller coaster. It twists ahead of us in the dark, although we can only see each part as we come to it. We can sometimes see around the bend but the future is fixed and determined. We are locked in our seats and nothing we may know or do will change the course that is laid out for us.

2. *Mighty River*

The future is a mighty river. The great force of history flows along, carrying us with it. Its course can be changed but only by natural disasters, like earthquakes and landslides, or by massive concerted human efforts on a similar scale. However, we are free as individuals to adapt to the course of history, either well or poorly. By looking ahead, we can avoid sandbars and whirlpools and pick the best path through any rapids.

3. *Great Ocean*

The future is a great ocean. There are many possible destinations, and many different paths to each destination. By taking advantage of the main currents of change, keeping a sharp lookout posted, and moving carefully in uncharted waters, a good navigator can get safely to the charted destination, barring a typhoon or other disaster that cannot be predicted or avoided.

4. *Colossal Dice Game*

The future is entirely random, a colossal dice game. Every second things happen that could have happened another way to produce another future. Since everything is chance, all we can do is play the game, pray to the gods of fortune and enjoy what good luck comes our way.

Learn from Your Metaphor

To help you understand the meaning of your metaphor, think about your answers to the following questions:

*Which of the four metaphors most closely resembles your vision of the future? Why?

(continued on next page)

* What didn't you like about the other metaphors?

* Do you think you can control your future? How much do you think you can affect future events?

Your answers may not be well-developed yet because you haven't given it a lot of thought. But your answers are very important to your decision making and often determine what you do. Keep working on your answers and your metaphor.

Create a Personal Metaphor

Now create your own metaphor of the future or of life if you prefer. What describes your vision? Try to use something familiar to you: a hobby, a favorite thing, activity or animal – anything. Don't worry about being fancy or poetic.

* To me the future is...

Keep this metaphor and work with it, expand it, modify it, change it, or get a new one. See if it can give you some insights into your future vision or to help you expand or change your vision.

Email H B at <hb@gelattpartners.com> with your feedback or with questions about this article. Copyright © 2004 Gelatt Partners. All rights reserved.

From the Editor: (continued from p. 5)

Complexity theory requires a whole system change in mindset and this reminds me of an article by **Parker Palmer**, one of my favorite authors on educational change. In his article titled; *Divided No More: A Movement Approach to Educational Reform*, he writes that "the organizational approach to change is premised on the notion that bureaucracies—their rules, roles, and relationships define the limits of social reality within which change must happen. Organizations are essentially arrangements of power, so this approach to change asks: *How can the power contained within the boxes of this organization be rearranged or redirected to achieve the desired goal?* That is a good question except when it assumes that bureaucracies are the only game in town.

Palmer writes of the distinction between an *organizational* approach and a *movement* approach to change. He notes that "when an organizational mentality is imposed on a problem that requires movement sensibilities, the result is often despair." He points out that this "pits entrenched patterns of corporate power against fragile images of change harbored by a minority of individuals, and the match is inherently unfair. Constrained by this model, people with vision for change may devote themselves to persuading powerholders to see things their way, which drains energy away from the vision and breeds resentment among the visionaries when "permission" is not granted." This is the mistake many of us make in our struggle to bring about a new future of intelligence, integrity, and sustainability.

In PATTERNS we encourage a second-order cybernetic approach to rearrange this pattern. Palmer notes that an obsession with an organizational model allows for a perverse satisfaction in blaming the "other." When a path is blocked, we can indulge the perverse luxury of resentment rather than seek an alternative avenue of reform and we can blame it all on external forces rather than take responsibility upon ourselves. (see von Foerster's ethic on p.2) He writes; "There is a part of human nature that would rather remain hopeless than take the risk of new life. It is not uncommon for academics to be driven by this 'death wish,' even (and perhaps especially) the most idealistic among us. The most vigorous resistance to the movement model may come from reformers who have been defeated on one front and are too weary to open another. Sometimes it is easier to live with the

comfort of despair than with the challenge of knowing that change can happen despite the inertia of organizations."

As we celebrate **Martin Luther King Day** we remember the successes of the movement model. Palmer writes: "The black liberation movement and the women's movement would have died aborning if racist and sexist organizations had been allowed to define the rules of engagement. In both movements, advocates of change found sources of countervailing power outside of organizational structures." With this power of resistance energizing the struggle, they eventually gained leverage on organizations. They changed the law of the land.

The genius of movements is paradoxical: They abandon the logic of organizations in order to gather the power necessary to rewrite the logic of organizations.

I share Parker Palmer's belief that the reform of teaching and learning (the foundation of human societal viability) will happen only if we who care about it learn to live this paradox. In a future issue of PATTERNS we shall report on the movements involved in doing it.

Editor's Note:

In the last issue of PATTERNS **Elizabeth Burris** described passive and active epistemological errors. She would like us to note that this view should be attributed to family therapist P. F. Dell in an article, *Beyond Homeostasis: toward a concept of coherence*, Family Process, 21, 21-41.

Also....

Since you did not receive the November/December 2004 issue of PATTERNS, we invite you to visit our website:

<www.haven.net/patterns/> where you will find an Index of all issues since January 1996. Please feel free to order any issue to replace the missing one.

Please note my new email address
<bdawesvogl@yahoo.com>

(continued in next column)

Key to Accountability: What are we Locking out?

By Marion Brady

Marion Brady, a longtime educator, lives in Cocoa. He wrote this commentary for the Orlando Sentinel. He can be reached at <mbrady22@cfl.rr.com>

Certain words get a free ride. When we read or hear them, they go directly to our emotions without passing through our brains. "Natural" is such a word. In my local supermarket, it appears in big letters on boxes, bottles, jars, cans and wrappers, helping to sell bread, jelly, peanut butter, baby food, eye drops, hair spray, shampoo, hand lotion, Popsicles, ice cream, beans, cake mixes, cookies, cereal, digestive-system fiber, and much else. Fine print may point out that the word refers to only one ingredient, but fine print rarely gets read. If the word helps nudge a product off the shelf and into the grocery cart, it's done its work.

We have many such words and phrases: *Lite. Freedom. NEW! Democracy. Competition. IMPROVED! We. Quality. Fat-free. Original. Organic. Liberators.*

Add "accountability" to the list. Attached to "standards," as in the political mantra "standards and accountability," it's successful in the same way that the word "natural" is successful. It goes directly to voters' emotions without passing through their brains.

What does the word really mean? The dictionary isn't much help. It says that one should be accountable for one's acts; responsible; behavior should be defensible.

The education-improvement monkey should be taken off the backs of students and teachers

I don't know any teachers or school principals who reject the need for accountability. What's tearing a great many of them up, and sending some to early retirement, is deciding to whom they should be accountable. Official policy demands one thing; their desire to do what's best for kids demands something else.

Of course, most of those who're currently making education policy don't think that's a problem. They're sure that their demands are identical with what's best for kids, sure that everything important about educating can be measured and the result summed up in a single number or letter grade, sure, therefore, that No Child Left Behind's requirements for standardized testing, grade retention, school grading, public shaming and so on are real reforms.

And they've been very successful at convincing the general public that they're right, that their policies are the key to accountability. Those who oppose them — those who point to mountains of contrary research and firsthand experience showing that the new policies are simplistic and will prove to be disastrously counterproductive — get written off as unwilling to be held unaccountable.

There are, however, an increasing number of professionals angry enough to take a stand, and Nebraska's commissioner of education, Doug Christensen, is one of them. Nebraska's schools have a good reputation, and he aims to maintain and improve that reputation. What, then, should one think when he says, "I don't give a damn what No Child Left Behind (NCLB) says. I think education is far too complex to be reduced to a single score. . . . If it's bad for kids, we're not going to do it."

Is he refusing to be held accountable? Irresponsible? Self-serving? Or is he seeing "accountability" as something owed to students rather than to politicians whose views are too often skewed by political considerations?

Christensen doesn't think Nebraska's schools are exemplary. But neither does he buy Washington's contention, echoed in most state capitols (with an eye on federal money), that NCLB is the key to improvement. He thinks the real problem is that schools really haven't changed much in the past hundred years and need more flexibility to rethink what they're doing and why. He argues that the curriculum lacks clarity, focus and coherence. He says schools — particularly those above the elementary level — are far too big, aren't sufficiently integrated with the communities they serve, and don't make adequate provision for how kids differ from each other. He thinks student educational experience doesn't flow smoothly from one level to the next, and believes research is a better guide to reform than what often passes for common sense.

Think about Christensen's list of problems. Not a single item on it lies primarily in the realm of teacher or student control and responsibility. Everything he thinks is necessary to improve the quality of schooling requires a loosening rather than a tightening of centralized, bureaucratic control.

Which means that the education-improvement monkey should be taken off the backs of students and teachers and put where it belongs — on the backs of legislators in Washington and in state capitols. They've hung the "standards and accountability" slogan in the wrong place, and milked it for political advantage long enough.

Call or write those legislators. Tell them that Doug Christensen has it right, that more and more of their constituents know it, and you're going to hold them accountable.

**Helping Educators Develop New Ways
of Thinking About Education**

Washington Center for Complexity and Public Policy
One Dupont Circle N.W. Suite 700 Washington D.C. 20036-1133
202/429-3733 info@complexsys.org

What do today's students need to become lifetime learners, workers and citizens in a rapidly changing, complex and interconnected world? In what ways can complexity science help educators develop new ways of thinking about education in order to ensure that today's students are prepared to meet the challenges of the future?

U.S. Secretary of Education Rod Paige agreed that these two questions should be investigated by the Washington Center for Complexity & Public Policy and authorized a grant to the Center from the U.S. Department of Education.

The result of the Center's efforts will be incorporated into a report entitled, "*Education and the New Science*," which will be completed by March 1, 2003, and will include a set of recommendations and prototypes of educational materials for use within the Department. The project is based on complexity science, a new way of understanding the interrelated dynamics of systems and how seemingly small actions can have major impacts.

Irene Sanders, executive director of the Center, said, "Complexity science provides a new framework for thinking about and planning for the future, and complexity-based models are being used to provide insights on all kinds of important questions and policy issues."

She continued, "As a strong advocate for new ways of thinking about education and as part of the Administration's education reform agenda, Secretary Paige recognized the potential benefits of complexity science as a new framework for thinking about education within a futures context."

The Center also has launched a new website, www.complexsys.org, which will allow interested parties around the world to learn more about complexity science and its applications to strategic thinking and public policy-making.

Sanders established the Center in early 2001 in response to the growing interest in complexity science as a framework for understanding, influencing and developing better public policy. The Center's mission includes a strong emphasis on outreach to the public and policy-makers in order to promote "complexity science literacy," which makes it unique within the field.

With her book, *Strategic Thinking and the New Science: Planning in the Midst of Chaos, Complexity and Change (The Free Press, 1998)*, Sanders pioneered the application of chaos theory and complexity to strategic thinking. She served as a legislative assistant to U.S. Senator Sam Nunn, developed and hosted a series for public television, created and directed executive education programs, and served as a consultant to the U.S. Department of Health and Human Service.

"Complexity science helps us understand the context, structure, processes and ongoing development of complex adaptive systems, such as our educational system," Sanders said. "It also helps us develop intuitive, associative forms of pattern recognition and use nonlinear thinking to respond to problems and, more importantly, to see and influence them before a crisis arises. This is what makes the new science so relevant to government at all levels."

While complexity science already has found wide applications in manufacturing, financial management, high tech and other fields, the Center is in the forefront of applying this new way of thinking to public policy. The Washington Center for Complexity & Public Policy is offering a new workshop for the intelligence community, Strategic Intelligence Analysis in a Complex World. It provides other educational seminars, conducts research and offers facilitation and consulting services.

PUBLICATIONS

COMPLICITY: AN INTERNATIONAL JOURNAL OF COMPLEXITY AND EDUCATION

Complexity is concerned with non-linear dynamics, emergence and self-organisation. It might be defined as a formal attempt to explore how simple and sometimes non-purposive components in a system can self-organise, emerge or evolve into coherent, purposive and complex wholes. Complexity theories are being utilised in the social science in many and various ways ranging from the highly technical, philosophical, narrative and more recently the applied. COMPLICITY is interested in publishing work from any of these approaches.

The word 'complicity,' as Jack Cohen and Ian Stewart point out in *The Collapse of Chaos: Discovering Simplicity in a Complex World (New York: Penguin, 1994)*, has the same roots as the word 'complexity.' In their explication of the term, they contrast it to simplicity—which they define in terms of deterministic systems and sets of rules that always generate identical outcomes. Simplicity thus "merely explores the space of the possible"; "complicity enlarges it" (p. 415).

In this vein, *Complicity: An International Journal of Complexity and Education* is intended as a venue for the publication of scholarly papers that are oriented by the attitude that education is a matter of complicity__about enlarging the space of the possible__as opposed to the popular conviction that education is about replicating (or, sometimes, critiqueing) the existing possible.

***It takes wisdom
to have great power and make
gentle its presence
in the world.***

Congressman Dennis Kucinich

Trivializing Our Children

An excerpt from the conversation of Heinz von Foerster and Bernard Poerksen in the book,
Understanding Systems: Conversations on Epistemology and Ethics
Kluwer Academic/Plenum Publishers, N.Y. 2002

B. P. Heinz, you once came up with a statement that shows that your notions can be used to assess society. It goes as follows: "The majority of our institutionalized teaching efforts have the objective of trivializing our children."

H. F. Many people are of the opinion that the awful thing about children is that they do not behave in a predictable manner. They don't act like trivial machines that always generate the same output when a particular input is entered. Since our education system is set up to produce predictable citizens, its purpose is to eliminate those annoying inner states that allow unpredictability and creativity. It is often the case in school that a question has only one answer. You simply cannot say that two times two is 'green', as I have already mentioned. And yet if you think about it, it is a fantastic thought that could give rise to the question, "Why has this child answered 'Green'? What kind of ideas does he or she have?" And I assume that this child would tell me something that is extraordinarily wonderful or funny.

B.P. So you want to discount the idea that there is only one right answer and instead push the idea that there is a whole range of possible answers?

H.V. Of course. I still break into a smile when I think back to our high school, where we had a history teacher who only accepted one answer for the question, "What kind of people were the Greeks?" and the answer was "A Merry People." ...the only thing that was allowed was responding to the teacher's question with the same monotonous output. "*Herr Leher, the Greeks were a merry people.*"

B.P. These attempts at trivialization are relatively harmless.

H.F. I can give you countless other examples that are anything but harmless. They are horrible and heart-wrenching... I was once invited to lunch at the home of some friends of ours. Their little boy, who was supposed to have come home from school, didn't turn up for what seemed like ages. Finally he did show up, but he was crying and said, "I had to stay

after school!"

The boy told us that she had said that his answers had been rude. He said, "She asked me what 2×3 is and I told her, it's 3×2 ! Everybody laughed and the teacher made me stand in the corner."

I asked the little boy, "Your answer is exactly right, but can you prove that it is right?" He took a pencil and paper and drew two dots, and right above them, three dots. He said, "That is 3×2 " and then he turned the paper 90 degrees and said, "See Heinz, that is 2×3 !" The little boy, who was all of 7 years old, had proved the commutative law of multiplication in his own way: $A \times B$ is $B \times A$. The fact that the teacher was not able to see how ingenious this insight was is a tragedy. She had expected him to say "six." Since he didn't say that, his answer appeared to be false, rude, and even rebellious. That is what I call the trivialization of young people.

B.P. The logical conclusion is that every teacher must reckon with the basic nontriviality of his or her pupils.

H.F. Of course. And once the trivialization process has been successfully completed, the advanced teaching task is "detrivialization" which means pointing out other possible answers and encouraging pupils to come up with a variety of solutions and perspectives...

B.P. Neil Postman, an educator and media critic, once made a suggestion. The spectrum of perspectives could also be underscored by making a point of teaching even the hard sciences as historical disciplines in order to have these experiences of distinction, and to show that the same or similar questions have already been dealt with in very different ways throughout the course of history. For example, if you talk about atoms in school then you would also mention Democritus... When you cover optical phenomena, you link them to historical ideas of sight and vision that go back to ancient times, and so on. Postman's strict recommendation is to teach every subject as history. Of course it is difficult to

to give tests if you allow a whole range of answers. How are you supposed to figure out what pupils know?

H.F.... I am convinced that you can never know what pupils know. Since they are nontrivial systems, they must be considered to be analytically inaccessible. I think that all these tests and exams don't actually test the pupils, but that the tests test themselves. My thesis on this point is "*tests test tests.*"

B.P. I don't quite understand this slogan. Now what I can follow is the conventional assumption, which is "tests test those being tested."

(Heinz uses as explanation, Alan Turing's quest to discover if machines can think—the so-called Turing Test in which several scholars are not allowed to see an entity behind a curtain to which they are asked to direct questions. The purpose of the test is to discover if it is a machine or a human being or whether the question is undecidable.)

B.P. So, on the basis of the answers, they decide that the thing behind the curtain is a human being, but it turns out to be a machine. This proves that the machine is intelligent.

H.F. Exactly. But the way I see it, and now I'm returning to my thesis, the potential intelligence of the machine is not being tested. In actual fact, the scholars are testing themselves...to determine whether or not they can tell a human being from a machine...The way I see it, the examiners are examining themselves, not the entity that is meekly sitting behind the curtain and providing answers for their questions. As I said, "*Tests test tests.*"

B.P. Well, then in terms of this, what is the "good report card" that a pupil gets?

H.F. A good report card is evidence of successful trivialization. If you actually consistently give the right answers_click,click,click_ you get good or even excellent grades. That's the long and the short of it.

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