SIG Newsletter

To apply, advance, and extend chaos and complexity theories to inquiry, research, and theory related to educational contexts.

Contents   Spring 2005
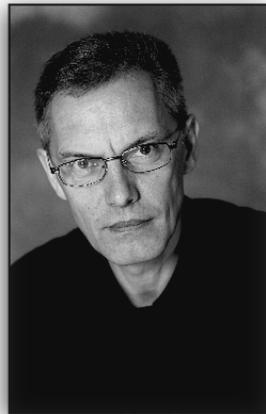
A Message From the President

At last years business meeting in the Chaos and Complexity SIG Michael J. Jacobson, Korea University gave an inspiring presentation on complex systems, research issues and educational challenges. Among many examples he especially focused on the complexity of traffic jams. After having shown a simulation of a traffic jam he rhetorically asked, what produces a traffic jam? Before he himself answered the question he told that he had posed the same question to his students, and to every body's amusement he explained that the students' answer was - stupid drivers. The students' answer was as all in a chaos and complexity community easily could see a misconception. Or was it?

The simulation showed that traffic jams are produced by themselves. Traffic jams are self organized. When cars go forward at a certain speed and meet an obstacle they start braking and the jam emerges, and it emerges backwards. But this is what happens in a simulation that does not take drivers in consideration.

Cars in themselves are what Heinz von Foerster called trivial machines. A trivial machine is constructed in such a way that it connects a cause with an effect or in other words when a trivial machine experiences a cause it produces an effect from a specific rule. Like the cars in the simulation. But driven cars in the real world need drivers and drivers are human beings with consciousness.

Consciousness does not belong to the category of trivial machines but to the category of non-trivial machines. Trivial machines are predictable, non-trivial machines are unpredictable. Trivial machines can be handled as if they are simple problems, non-trivial machines, e.g. human beings must be handled as complex and contingent problems.

From this it becomes visible that a car running into a traffic jam is not just a car but a car run by a conscious human being. Such cars, i.e. car plus driver, will never act simplistic as the cars in the simulation, because the drivers will try to adjust the speed of the car according to the circumstances. It does not mean that traffic jams can be avoided, but it means that the risk of a traffic jam is reduced if and when drivers foresee it and run the car with a soft foot on the speeder, and not just go forward in a specific speed till an obstacle is met like the cars in the simulation. Seen in this way it seems like the students answer, stupid drivers, is not as stupid as it seemed to be in the first place.

So what can we learn from this? Well, first of all it tells us once again the importance of always listening to our students, but it also tells us that when we are dealing with chaos and complexity in educational settings we have to take consciousness into consideration.

~Jens Rassmussen

Jens Rasmussen

The Program in Montreal

Our hope is again to have an exciting program in Montreal. **Our speaker at our Business Meeting/Invited Presentation** this year will have a different thrust, one most timely. Dr. Shalom Back of the Key College in Beer-Shiva, Israel will present his work, in the neg., over the past decades in bring together Jews and Arabs in a teacher education, co-existence program. Creating a community where "respect, tolerance, honesty and trust" are not only valued but lived is one of the goals of Kaye College. Dr. Back, in addition to being an administrator is also a scholar with a strong background in western intellectual thought. We are most fortunate to have him with us. I am certain all attending will find listening to and conversing with Dr. Back a rewarding experience.

Our Sessions

Monday: Business Meeting

Wednesday: Hyu-Yong Park

Thursday: 7 Roundtables

Friday: Rasmussen & Chauvin Larouche

Friday: Reynolds and Jewett

OUR DISCUSSION PAPERS

Paper Session 1: Chaos Theory and Democratic Decision Making

Chair: Bernard Ricca

Participant: Hyu-Yong Park "An application of Chaos Theory to Educational decision-making process - The democratic way of decision"

Discussant: Tony Whitson

Paper Session 2: Gregory Bateson, Culture and Mind

Chair: Fran Huckaby

Participant: Laura Jewett "Minding Culture: Gregory Bateson, Culture, and Curriculum"

Participant: Sherrie Reynolds "Emotion: another way that culture and mind shape each other?"

Paper Session 3: Schooling and Self-Organization

Chair: Sarah Smitherman

Participant: Jens Rasmussen "The problem of complexity/diversity in the Nordic comprehensive school"

Participants: Romona Chauvin & Lyubov Laroche "Self-Organizational Currents in Teacher Education: Innovative Practices"

Discussant: M. Jayne Fleener

Business Meeting

Chair: Jens Rasmussen

Participant: Shlomo Back "Educating for Peace and Co-Existence: Bringing Jews and Arabs Together"

Discussant: William Doll

Roundtables

Participant: Roger Roy "An Application of Complexity Theory to Student academic Success"

Participant: Susan Erwin "Collapsing Possibilities of Knowing"

Participant: Don Duggan-Haas "Ecological Function and Renewal in the Edusphere"

Participant: A. Christine Bennet-Clark "Enaction: Getting our Minds Around Emergent Cognition"

Participant: Dan Rea "Every Child A Rising Star': Education for Emergent Well-Being"

Participant: Donald Gilstrap "Leadership and Strange Attractors: Metaphor and Scenario-Building in Complex Organizations"

Participant: Ton Jörg "Reinventing Reality of Education: Towards a Comple Generative Pedagogy"

(Related Chaos & Complexity SIG material: Jeff Bloom's report: "Bateson @ 100" on the recent conference celebrating Bateson' centennial).

John St.Julien our webmaster has, in fine form, put the 2005 program on our website: ccaerasig.com.

All of these should be most interesting. Thanks for your continued support of the SIG.

~William Doll, Jr.

BATESON @ 100: MULTIPLE VERSIONS OF THE WORLD: A CONFERENCE CELEBRATING BATESON'S CENTENNIAL AND HIS CONTINUED INFLUENCE

"Reading Gregory Bateson can be dangerous for your mental health"
~Mary Catherine Bateson

On November 20, 2004, a group of 150 people met at University of California-Berkeley's Lawrence Hall of Science in

celebration of Gregory Bateson's work. Sitting atop the mountain overlooking the town of Berkeley, San Francisco Bay, and the Golden Gate Bridge, the meeting delved into reminiscences of the life of Gregory Bateson and a variety of ongoing themes and issues stemming from his work. Sitting and talking with Lois Bateson (Gregory's third wife) at the reception the evening before, her final statement to me captured the essence of this conference. Softly, yet with conviction, she looked me in the eye and said, "you know what it was about Gregory's thinking? He thought with his heart. He had a big mind, but he thought with his heart."

The array of individuals who presented at the conference included, Nora Bateson (Gregory's youngest daughter of Lois), Mary Catherine Bateson (Gregory's oldest daughter of Margaret Mead), Jay Ogilvy (co-founder of the Global Business Network), Charles Hampden-Turner (Senior research associate in International Strategic Management, Cambridge University), Kenny Ausubel (Bioneers and Collective Heritage Institute), Carol Wilder (Associate Dean, New School University), Tyler Volk (Associate Professor, Department of Biology, New York University), Terry Deacon (Professor of Biological Anthropology and Linguistics, UC-Berkeley), Stephen Nachmanovitch (author, musician, computer artist, and educator), Jean Houston (Co-Director of the Foundation for Mind Research), Jerry Brown (former governor of California and Mayor of Oakland, California), Nathan Gray (co-founder of Oxfam and current director Earth Train International), and Peter Harries-Jones (emeritus professor, Department of Anthropology, York University, Toronto). Interspersed among the presentations were an audio-tape-slide show of Gregory's commencement speech to the University of California-Santa Clara and a preview of Nora Bateson's upcoming documentary on the life of Gregory Bateson: That Reminds Me of a Story (available on DVD in late 2005).

The "meat" of the conference centered around a number of themes, all of which

seemed to be subsumed by Mary Catherine's discussion of epistemological shock. Deeply rooted in our emotional stakes of our own versions of the world, epistemological shock was the approach Gregory Bateson took to teaching and mentoring. The human conundrum of confusing the map for the territory is what Gregory, through a variety of means, tried to undo. In his UC-Santa Clara commencement speech, he, with great humor, presented the shock in explaining how everything these graduates had learned in their past four years was wrong. What they had learned through language was to subdivide things into things creating a mistaken dualism that missed the essence of the "unity of relationships to relationships." Mary Catherine suggested that children need to learn about paradox and logical types as ways of understanding the double binds (the dualistic conflicting messages) that we live with throughout our lives.

Schizmogenesis, the process of separation and disconnect, permeated most of the presentations and informal discussions, with special focus by Charles Hampden-Turner. The term "schizmogenesis" was first used to describe the rise of Nazi Germany, with obvious corollaries to the current political situation in the United States. The common schizmogenetic splits we encounter are those of mind and body, will-power and weakness, strength and relaxation. All of which oscillate in feedback loops as in the alcoholic who goes from on-the-wagon to off-the-wagon and back again perpetuating a fundamental mind-body disconnect. Such schizmogenetic patterns can be found in the political rhetoric of loving sacrifice combined with the reality of war in the trenches. The fundamental disconnect manifests as "moralizing our way into violence" (Hampden-Turner).

In 1976, Governor Jerry Brown appointed Gregory Bateson to the Board of Regents of the University of California, which was truly a skillful political epistemological shock. In Jerry Brown's first post-midnight meeting with Gregory, he

learned that "the part cannot control the whole," which translated into "humans can't control the biosphere." In essence, much like Lois Bateson's description of Gregory as thinking with his heart, Jerry Brown described Bateson as the epitome of "caring and thinking with clarity."

Gregory Bateson was and still is hard to pigeon-hole. His thinking spanned many disciplines. However, at the core, he was concerned with unity, with approaches to thinking that connected and avoided the dangerous path of disconnect and schizmogenesis. These are ideas, which we all need to ponder.

~JEFF BLOOM
NORTHERN ARIZONA UNIVERSITY,
FOR AERA CHAOS AND COMPLEXITY
SPECIAL INTEREST GROUP NEWS-
LETTER

Gregory Bateson's books:
Bateson, G. (1936; 1958). *Naven (2nd ed.)*. Stanford, CA: Stanford University Press.

Bateson, G. (1972). *Steps to an ecology of mind: The new information sciences can lead to a new understanding of man*. New York: Ballantine Books. (back in print)

Bateson, G. (1979). *Mind and nature: A necessary unity*. New York: Bantam Books. (back in print)

Bateson, G., & Bateson, M. C. (1987). *Angels fear: Towards an epistemology of the sacred*. New York: Macmillan.

Bateson, G. (Donaldson, R. E. [Ed.]). (1991). *A sacred unity: Further steps to an ecology of mind*. New York: Cornelia & Michael Bessie Book/Harper Collins.

The conference proceedings and videos will be available as a DVD set:
$75 plus $5 shipping and handling Proceeds will benefit the completion of the upcoming film about Bateson's life: *That Reminds Me of a Story.*

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Letter to the SIG:

GROWING AWARENESS AND SADNESS

To those who are concerned with the functioning of our SIG Chaos and Complexity

I am rather disappointed in how those responsible for the programming of our SIG view the topic of complexity and education. This manifests itself in the decisions made in our SIG about programming of the program of the AERA in 2005 and the years behind us.
The programming is for me really disappointing. I will clarify that below.

"Pedagogy is never innocent," Jerome Bruner told us already some years ago (1996, p. 52). This is as much true for our view on complexity and education in our SIG.

The AERA is supposed to be a scientific conference focused on educational research.

What I notice, already for so many years, is that the discussion on the topic of interest in our SIG Chaos and Complexity is not really a scientific one. The real focus is on the curriculum: how to build a nice curriculum with notions on Chaos and Complexity. But it is only seldom that there is really a kind of reporting on doing research on that very topic. The topic, now, is about stories on complexity and the curriculum, full of nice metaphors indeed! But it keeps on being so, already for so many years, but I have to say it rather sadly: without real progress. There is no real change in the view about education itself which is based on complexity theories. It seems enough for our SIG that complexity may somehow be 'applied' to education. But, in my view this notion about application of complexity theories is fully wrong (see also Stacey, 2003). For those theories up until now do not really explain how learning and education may be fostered. It is all still very much descriptive. There is no urge to do it differently. In my view we do not seem to speak the same language. The language needed for a real revision of learning and education.

The response on my work, i.e. on my proposals for many years in succession, which tries to build a new science of learning and education to be founded on a new complexity theory is rather ambivalent: positive of itself, but it does not seem so apt for the whole group of our SIG. But I do not get an idea about the reasons why it has not been taken as a serious subject for presentation. There seems no real trust of the topic being worthy for our group. But there is also no real thinking along, no real human 'attainment' with my thoughts on this subject. I

feel like staying in a reservation of ideas and thoughts, without resources available. That makes me real sad. Of course.

~TON JORG,
THE NETHERLANDS

COMMENTS ON RICHARD BIRD'S CHAOS AND LIFE BY BARNEY RICCA

In the banter that often occurred before class during my first graduate mathematics course, the professor often complained, in a quite excited and animated manner, about all of the problems he found with Bertrand Russell's writings. As reports of these disagreements went on long into the semester, someone finally asked the professor why he continued to read Russell, if Russell was so wrong. The response was "Because he's wrong in such profound and insightful ways. No one else makes me clarify and deepen my own thoughts so much."

The preface of Richard Bird's Chaos and Life begins "This is a book about chaos and life, and mostly it tells its own story." The story is written both with passion and insight, tracing a notion of iteration though a number of stops. While it is quite a story, caveat lector: This is not a story to be undertaken lightly, for it can be insightful, speculative, and sometimes even wrong, but always makes a subtle argument, and the unwary reader could be misled.

While the first ideas of the book - a critique of neo-Darwinism, and an introduction to chaos theory and fractals - are very well thought out, the book becomes more speculative in nature as it progresses. One difficulty that will confront the reader is that there are no clear indications of what is a reasonably well-known (if not widely-known) idea, and what is more of a possibility to be investigated; in these early chapters there is very little that falls into the "possibility" category. (In fact, Bird's critique of neo-Darwinism is one

of the best compilations I have seen.) However, after these initial sections, the ideas become much less grounded in current theory, and too often argue based on incomplete ideas.

One example of where the story is problematic, is the treatment of recursion. (This treatment occurs in the subsection An Endnote on Recursion in Chapter Nine.) In examining the idea of factorial, Bird attempts to draw a distinction between the factorial written from highest to lowest terms[1], and one with the factors written in the opposite order as having to do with a reversal of time. He then uses an incomplete recursive definition of factorial to make further arguments about time. Since recursion is an important part of several arguments made in the book, the missing pieces in this presentation call into question some of the other claims.

Because of the subtle nature of many of the arguments, the need to very carefully examine all of the presentation, and some of the background material required to engage this book appropriately, this is not a good introduction to chaos. Those new to the field would find many other books more appropriate for that purpose[2].

However, for the reader who is looking for some of the potential of chaos theory, some interesting territory to explore, and is willing to accept the unfinished (and occasionally incorrect) nature of the investigation, this can be a good book. Chaos and Life has some good insights and critiques of modern science, and presents some tantalizing ideas of what may be possible. In this respect, then, I must echo my math professor's sentiment: I am a bit excited to disagree with much of Chaos and Life. I think that the prepared and serious reader can benefit from a reading, too.

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[1] The factorial of n is usually defined by

$$n! = n \quad (n-1) \quad (n-2)\ldots1.$$

[2] Some of these texts include Edward Lorenz, The Essence of Chaos; David Ruelle, Chance and Chaos; Steven Johnson, Emergence; Murray Gell-Mann, The Quark and the Jaguar; William Poundstone, The Recursive Universe; and Stuart Kauffman, At Home in the Universe.