



American Educational Research Association

Vol. 1 #2 Spring 1996

Inside...

Don't Miss the General Meeting!
The Thursday Roundtables
Membership form

Resources:

The SIG Website
NPR Science Friday: Complexity

Gloss:

Heuristic Thoughts on Learning as Chaos

AERA
Special

GRAPHIS: The banner graphic again this issue is from the Mandelbrot set at magnification= $2.879e6$, $i=.00321944$, and $r=.26572249$. I call it "Elephants on Parade." It is a good example of constitutive self-similarity: how many elephants does it take to make the big elephant?

AERA/Chaos & Complexity SIG
c/o John St. Julien
Room 388 Education, MC 708
1310 S. Sixth Street
Dept. of Curriculum & Instruction
University of Illinois, Urbana-Champaign
Champaign, IL 61820

Don't miss the General Meeting!

Our "business" meeting will be Tuesday from 6:15--8:15 on the third floor of the Sheraton Hotel in room Liberty 4.

Members are encouraged to bring a friend. Potential members are encouraged to join us for the evening! This session will probably be our best chance to "mix" and get to know our colleagues in the SIG and locate common interests.

At the business meeting we will be reporting on progress during the first year of the group, as well as electing new officers. When the more technical details are completed—and our president promises that this can be done in short order—we will hear two exciting talks.

First, Bill Doll will address the meeting with a talk entitled: "Reflections on Complexity and Chaos." Bill's style is inimitable and we can expect an expressive presentation and an interesting discussion.

Dr. Doll is a Professor of Curriculum at Louisiana State University. He has written widely on issues of chaos and postmodernism in education including: *A Post-Modern Perspective on Curriculum* (1993).

Our second speaker will be Jeffrey Goldstein who will give a demonstration on phase graphing techniques. Complexity theories are different enough epistemologically to have spawned new analytical techniques—and phase graphing is one of the most interesting new ways to explore the patterns which we associate with chaos and complexity.

Jeff is Professor of Organizational Behavior at Adelphi College.

His publications include *The Unshackled Organization: Facing the Challenge of Unpredictability through Spontaneous Reorganization* (1994)

and *Brainwaves for a Diverse Workplace* (1994). He is former President of the Society for Chaos Theory in Psychology and the Life Sciences.

RESOURCES

THE SIG WEBSITE

The SIG has a new resource: a still wet-behind-the-ears website. It is called, unsurprisingly, "Chaos & Complexity Theory in Education." Its primary purpose is to help SIG members stay abreast of the affairs of the SIG, to inform them of opportunities and resources, and to put key concepts before them. But the SIG will also be interested in contributing to a larger community exploring new analytical tools in relation to issues of learning, development, and community organization.

If you haven't succumbed to the general media frenzy concerning the world wide web you now have one more reason to launch your very own web browser. The web is an exciting place; a click of the mouse can bring you into an entirely different conceptual universe—and their variety and interconnectedness can seem almost infinite. This gee-whiz factor is what we usually hear about. But a website can be a valuable part of a larger ecology of communication technologies. Like books and journals, a website is always there. However, a site is much more flexible than printed media; if kept manageable it can change very rapidly as conditions change and can provide day-to-day information easily. The links which lie at the heart of web make it an ideal way to provide references and organize information.

Reflecting my role as newsletter editor, I have organized the site around the SIG and the general topic of complexity. There is a home page (the index) and a three informational pages. The most topical is one on upcoming sig activities in New York. This is an easy place to find the times and locations of all the Chaos and Complexity sessions during AERA. There is also a page of annotated links on the topic of chaos and complexity theories. The third is a link to an acrobat formatted version of our first newsletter--you can find out how to access it on the link page. It has the virtue of being printable--you can printout a handsome version of the newsletter to pass around and promote the SIG; it comes complete with an application form.

The site is located at: <http://mac246.ed.uiuc.edu/coe/projects/chaos/>

Come by for a visit, and let me know what you would like to see there.
email: stjulien@uiuc.edu

HEURISTIC THOUGHTS ON LEARNING AS CHAOS

In the last newsletter John St. Julien fortuitously gave us a gloss — a brief explanatory note, often of a difficult expression — on Walter Freeman’s article, “The Physiology of Perception” in *Scientific American*, 264 (February, 1991: 78-85). As John states the article itself is about a mundane (but most important) activity, “a rabbit recognizing a smell.” I encourage all to read the article; I’ve xeroxed one for myself (and may well talk about it at our annual meeting).

What John has done is to extract some points for perusal that for me at least were heuristic — “guiding of further investigation” — in regard to curriculum and instruction, my fields. As with John, I’ll be brief. John’s points were (I could even say *are*):

- *foreground and background*. This brought to my mind Gregory Bateson’s idea that learning occurs through contrast and difference. Our curriculum would benefit from, indeed I’d say needs, to have contrast, difference, perturbation

(Kuhn), disequilibrium (Piaget), problematics (French poststructuralists), real life problems (Dewey) built into it.

- *categorization as different things being interpreted as the same*. I find two ideas united here — the concept of category formation as essential to learning and metaphor as a fine vehicle for this happening. Again, more metaphor (less logic?) in the curriculum.

- *recognition as of a pattern, not of subsets of features*. Another essential curriculum and instruction point, I believe. We need to look for, search for, create, and be presented material in a patterned manner. The emphasis here is on the relationships (may I plug one of my 4 R’s?) among the features not on the features (facts) themselves in isolation. To be didactic — our curriculum has been far too atomistic (not to mention linear).

- *memory as associative*. This brings up the whole *currere* (Pinar) concept. Memory is personal association — curriculum needs to

emphasize, Dewey would say begin with, the personal experiences of the one “running the course (*currere*) and not pay exclusive attention to the “racecourse itself” (*curriculum*). Interestingly, my comments here about *currere* and *curriculum* are literal, not metaphorical.

- *meaningful perception as based on experience and activity*. To a strong degree this point is covered in the previous one on *currere* but is worth repeating and reemphasizing from the experience/activity view. That which is meaningful comes from the activity of our experiencing — doing and reflecting. It is almost (I’d say, with Dewey, really is) a by-product of this doing/reflecting process.

I hope my comments are heuristic for others, as John’s were for me.

—Bill Doll

gloss a brief explanatory note or translation of a difficult or technical expression, usually inserted in the margin or between lines of a text or manuscript.

The Thursday Roundtables: 9:35-10:15

The titles of the Chaos and Complexity SIG roundtables demonstrate the diversity of our SIG—and the roundtable format will allow us to discuss these ideas with their authors in an intimate setting.

- TABLE 3 Chaos Theory in Retrospect: Synthesis of a 5-Year Study in Educational Administration. Billie Blair, CSU, San Bernardino
- TABLE 4 Metaphors of Chaos Theory and Some Implications for

Educational Leadership in Democratic Schools. Jeanne Fiene, University of Missouri, Columbia

- TABLE 5 The Role of Systemic Change in Effecting Liberation and Dissipation of Deep Structures: One School’s Story Through the Lens of Chaos and Complexity. Patrick Jenlink, Learning Systems Change Group; Alison Carr, Penn State University

- TABLE 6 Application of Chaos Theory to Family Interaction. Mattmijs Koopmans, Board of

Education, Newark

- TABLE 7 A Rigorous Indeterminacy? Chaos, Complexity, and Curriculum Inquiry. Noel Gough, Deakin University, Australia
- TABLE 8 [New Title!] Moving from Deconstruction to ‘Enconstruction’: Creative Literacy and Phase Diagrams. Robert Kahn, University of Missouri, Kansas City
- TABLE 9 A Generative Transformational Approach to Educational Theory. Jean McNiff, independent consultant

<http://www.realaudio.com/content/npr/nf1103.html>

One of the most exciting possibilities of the world wide web is the way in which events such as a conversation, which we are used to treating as ephemeral, can be captured digitally and made available on demand. Consider the possibilities that could emerge if those rare, riveting dialogical moments could be shared as easily as a journal article. It is now possible. Simply enter the URL (uniform resource locator) that heads this article in your web browser and jump to one of the most interesting conversations about complexity and chaos that I have heard.

On November 3, 1995 National Public Radio's program Science Friday broadcast a contentious discussion, "Complexity," which featured a conversation between John Holland, Stuart Kauffman, Peter Coveney, and John Horgan. It was spirited in a way that only face to face conversations tend to be.

Holland (*Hidden Order: How Adaptation Builds Complexity*), Kauffman (*At Home in the Universe: The Search for the Laws of Self-Organization and Complexity*), and Convey (*Frontiers of Complexity: The Search for Order in a Chaotic World*) are advocates of a complex style of analysis. Horgan (*The End of Science: Facing the Limits of Knowledge in the Twilight of the Scientific Age*) is a critic who believes that this class of theories promises too much.

The discussion covered two of the most interesting disagreements concerning the nature and value of complexity. The first issue was whether complexity aspires to be a "theory of everything" or is more fairly understood as a new way of analyzing the world likely to result in *many* new theories. The second centered on whether mathematical models imply a mechanical understanding of natural phenomena or whether such tools are simply another descriptive human language.

The advocates of a complexity regarded the field as an analytical tool which was likely to result in multiple new theories. They also seemed to regard mathematical models as descriptive rather than identifying any single mathematical model as identical to "reality."

This conversation is indexed on the SIG website which also includes pointers to the free software that is necessary to hear it.

Membership has its benefits

For a small investment of \$5 you can receive your very own copy of the newsletter with its SIG news, opportunities and pointers to resources in the field. Chaos and complexity theories are exciting new ways of thinking about educational problems and SIG membership will both keep you on top of the latest developments in theory and will point you toward some of the most exciting applications in practice.

SIG membership also carries easy access to the SIG email list, ChaoPlex, a developing web site, and early reviews and information on SIG activities at AERA. Join in the activity!

A REMINDER: 1996 MEMBERSHIP FEE OF \$5 IS NOW DUE

Become a member.

You'll receive our quarterly newsletter, advance notice of sig activities, and other opportunities.

Mail this form along with a \$5 check payable to AERA SIG to:

Bob Khan
Room 232, School of Education
University of Missouri
Kansas City, MO 64110-2499

email: rkahn@cctr.umkc.edu

Name _____
 Position _____
 Address _____

 City/State/Postal Code _____
 Country _____
 Telephone _____
 Email _____
 Particular Interests _____
