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GRAPHIS: The banner graphic 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? Children like this one.

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# SIG activities in New York

The Chaos and Complexity Theory SIG is gearing up for its first set of sessions at AERA. Dr. Doll of Louisiana State has ably chaired the sessions committee and the size of our membership allowed us to offer one main, two-hour session and seven roundtables. (See the recruitment form on the back page.) This is an ambitious outing for a first-time SIG and we have quite a selection of interesting papers.

A trip to the roundtable sessions will reward you with an overview of the various ways that chaos and complexity theories can be applied in education. They will be covering topics in educational administration, educational leadership, schooling, family interaction, curriculum, literacy, and educational theory. The point of view provided by C & C theories proves powerful and the use of methodologies seldom seen in educational research is fascinating.

The main session will be the focus of SIG activities. The title of the Brent Davis and Dennis Sumara presentation is "From Complexity to Complicity: Reading Complexity Theory as an Ethical Imperative." The session is designed as an interactive one; the presenters urge you to come prepared to participate. The title refers to the Cohen and Stewart book *The Collapse of Chaos: Discovering Simplicity in a Complex World* published by Penguin Press. One of the challenges of our SIG will be to develop a common working vocabulary and set of references. Reading this book would make a good start on this process—and greatly enhance the session. Cohen and Stewart, for instance,

divide complexity theories into the areas "simplicity" and "complicity" and prescribe very different hopes for their future development—a

distinction and a judgement which have large implications for the way that we use complexity theories in education. It should be exciting.

## RESOURCES

### CHAOPLEX: THE SIG EMAIL LIST

You have a home online! The Chaos and Complexity SIG is sponsoring an email list called, appropriately enough, Chaos and Complexity Theory and Learning or, in computerese: ChaoPlex. Our thanks to Barbara Sitko at Washington State for managing this resource. The basic idea behind a list is simple: you send your email message to a central location and a program there sends a copy to everyone who has "subscribed." Someone else comments on the remarks and sends the central location a reply. Again, that message is copied to everyone else. The discussion is off and running.

If you are unfamiliar with such lists you are in for a treat; they are one of the real pleasures of cyberspace. Lists are organized around a common interest which acts as focus for discussion. The level of conversation is often very high—people join only lists that they are really interested in and often the best minds in a field will congregate on a few related lists. Lists are designed for active participation but it is easy to enter the water gradually. Anyone can listen for a while in order to get the flavor of the discussion before diving in.

Lists can be more or less open to the public and more or less edited by the listowner. Our online presence, appropriately enough, is an open system: it is open to all and is "unmoderated." We anticipate an exciting period of self-organization as the members of the SIG and other interested parties get to know each other.

Our list is already up and appears to be running smoothly. Activity is sparse (this is the first public announcement of the list!) but as I write there is a short series of messages about list members' interest in chaos and complexity theories and how it informs their educational work. You can join by sending an email message to: **listproc@listproc.wsu.edu** with the message (and only the message): **subscribe chaoplex FirstName LastName** where "Firstname LastName" is your name. You will receive an automatic email message from the listproc program on the Washington machine acknowledging your subscription, telling you how to post messages, and noting where to get more information. Simple enough.

Let the conversation begin!

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## A chaos & complexity theory gloss

# LEARNING AS A CHAOTIC PHENOMENON

**Freeman, Walter J. "The Physiology of Perception." *Scientific American* 264 (February, 1991): 78-85.**

<http://sulcus.berkeley.edu/FLM/MS/Physio.Percept.html>

Walter Freeman does us one of the greatest of all services: he takes the commonplace and reveals its uncommon strangeness. This brief article asks us to see perception, learning, and memory—and by implication, thought itself—as examples of briefly stable chaotic patterns.

The implications for education could not be greater.

The context is mundane. The article examines EEG recordings of a rabbit recognizing a smell. But surely recognition of the letter "A" by a child is basically similar—as is the recognition of the chorus of Handel's *Messiah*. Freeman shows us how important but often dis-

missed ideas can be understood as the consequence of chaotic organization in motion:

- foreground and background
- categorization as different things being interpreted as the same
- recognition as of a pattern, not of subsets of features
- memory as associative
- meaningful perception as based on experience and activity

These are not unique ideas; in fact, pragmatic and gestaltist ideas survived in education while behaviorism held sway in the academy. But what is unique, and uniquely powerful, is how Freeman derives them. Educators stubbornly adhere to such ideas because they explain our experience; this is often regarded as naive. Freeman arrives at them empirically, as a matter of the consequences of the way that our neurology is arranged, as a matter of the basic architecture that gives

rise to mind. For Freeman, recall *is* a jump from the basin of one chaotic attractor to another, the mind *is* a self-organizing entity and his phase-state diagrams are pictures of recognition in action.

The power of such research for educators is not the marginal utility of charting the patterns in an individual as he or she learns to recognize the letter "A," but that we and others outside of education are offered a chance to build a basic, materially-based theory of learning. Without such an understanding, that grail of educational research, a viable theory of instruction, is barely imaginable. Freeman's path points to a chaotic analysis of education's central mystery: what is learning?

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**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.*

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## About this newsletter . . .

You are holding in your hand the first issue of the newsletter of the AERA SIG in Chaos and Complexity Theory, an occasional letter. Expect another edition before AERA in New York.

Its 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. This is a bit broader than most SIG newsletters.

In part this broader purpose is a result of the relatively unusual nature of the SIG. Like few other SIGs it focuses on a way of understanding rather than on a single method or a topic of research or practice. A task of the SIG membership will be to develop an

understanding of what these theories are and how they can illuminate the practice of education and educational research. This is too large a task for a small newsletter. The yearly meetings and the ChaoPlex email list will be active sites respectively for more in-depth explorations and immediate, vital discussion. (Both of these are discussed elsewhere in this newsletter.) But the newsletter can help in the space that lies between lengthy considerations and short, responsive notes.

Functions of the newsletter will be to provide organizational news such as the schedule for the AERA sessions and the SIG meeting in New York; to post notices of various opportunities that the membership may wish to consider; and to announce conferences,

publication possibilities, and grant opportunities. Similarly, the newsletter would point to resources such as books, articles, or web sites that would interest the membership.

Following conversations with several SIG members I am also hoping to institute "glosses" on "complex" topics (such as historicity or particularity), using a particular book or event to organize a short explication of the idea.

As newsletter editor I'll be looking for help. No one person can possibly be in touch with all the opportunities or resources which SIG members might find helpful. I'd also like to solicit glosses from the membership. I can be contacted at [stjulien@uiuc.edu](mailto:stjulien@uiuc.edu) and through the department of Curriculum and Instruction at the University of Illinois, Urbana/Champaign. Help!

# Welcome to AERA's newest special interest group

Bill Doll has planned an exciting program for us next spring at AERA, and full details are in this newsletter. Also, you may want to take a look at his book: William E. Doll, Jr., *A Post-modern Perspective on Curriculum*. 1993. New York: Teachers College Press, where he comments, "A post-modernist paradigm is still in early stages of formation. No coherent theory has yet emerged to unite the disparate trends—constructive and deconstructive—inherent in the paradigm. Nor will such coherence emerge easily, for a post-modern paradigm wishes to utilize, not negate or overcome, these disparate trends" (p.128). That is the challenge that confronts us as educators.

Many members have commented on how they had previously been working in an isolated fashion and are happy to discover that others are interested in their ideas and hopes. How much we share is up to each of us, but building up trust among us (even when we disagree) is an

important goal of this particular SIG. This newsletter and other opportunities to share through the Internet are now being planned by our secretary, John St. Julien. Do take advantage of them.

We are growing steadily, but I trust not too fast, with 88 members, 24 of whom are from outside the United States. One reason for the high number of overseas members was my attendance at the European Educational Research Association Conference in Bath, England, where there were several sessions relevant to chaos and complexity theory. We look forward to hearing from those of you outside the States, as we recognize you often have a different and relevant perspective to contribute.

If you know of others who are interested, do ask them to join and encourage them to send a check for \$5 payable to "AERA SIG" to me. For those from outside the USA, we can often make arrangements for

them to "pay" with their ideas or references to relevant books.

I look forward to seeing you in New York City, April 8 to 12, 1996.

Bob Kahn

*Chair, AERA SIG in Chaos and Complexity Theory*

## 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!**

## 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:

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