Subj: I recently posted this on the forum
Date: Wednesday, June 2, 1999 5:55:35 PM
From: 73742.3523@compuserve.com
To: MBB1217@aol.com

Soumis par
Categorie

Public
Judith Snow
le 06/02 a 06:49 PM
Draft Synthesis

Borrowed from Elsewhere

We are exploring resilience, particularly in communities. I was looking again at the web site, http://www.resilientcommunities.org/. I have "lifted" this article, for purposes of our discussions. I believe we could benefit from visiting this web site, and its links. I am open to designing a collaboration with these people, such as inviting them to our symposium.
Judith

Strange Attractors, Paradigm shifts and Y2k

By David La Chapelle

On Christmas night in 1642 a new born child was struggling for his life. In the sky above a comet could be seen and those who contemplated the heavens
wondered what manner of catastrophe was predicted. The child, who was not
expected to survive, went on to live past eighty and usher into the western

world a fundamental shift in how the universe was perceived. The contributions he made laid the groundwork for a scientific-technological revolution which would change the face of the planet. Some might argue that
this revolution has had a catastrophic environmental effect and so in a way
the comet's legacy has been fulfilled.

Isaac Newton's mother left him with his grandparents when he was three. Isaac's father had died three months before he was born and she apparently
did not want to be burdened by raising him. It is widely agreed that this abandonment led to an extremely difficult life for Isaac Newton. He was secretive, suspicious of the outer world, and prone to wage long vindictive
battles against those whom he perceived had wronged him. This propensity for paranoid behavior locked him into a battle with Gottfried Wilhelm Leibniz over who was the true originator of calculus.

In one of the great ironies of history the machine which Isaac Newton's arch rival Leibniz helped bring into the world has opened the door an a paradigm shift which is changing the face of Newtonian determinism. Leibniz
not only was crucial in founding binary mathematics, the tool which has given us the modern world of computer science, but also made the first working calculating machine in the western world. He was a true godfather
of computing. The battle between Newton and Leibniz filled both men's lives
with much unhappiness. The battle was fought in vain because in retrospect
it appears that calculus appeared nearly simultaneously to both of the men
independently. It was simply "in the air".

Calculus, which has been called the mathematics which launched the industrial revolution, was a part of a paradigm shift which was beyond either Newton or Leibniz To understand how the great-grandchildren of Leibniz's machine now threaten to unseat the paradigm which Newton set

in
motion you will need to understand why a meteorologist in the 1960's changed the way causality is perceived by a bit of inattention.

Edward Lorenz had created a computer program to simulate weather change.
His machine was large, unwieldy and kept breaking down, but it worked. He

was able to create his own weather from a handful of mathematical formulations. Lorenz was on the cusp of taking the Newtonian dream of predictability into one of the most notoriously unpredictable realms: the weather. One fateful day he decided to use a shortcut. He wanted to examine
a particular sequence in greater detail. Instead of starting the computational run over he began the machine in mid sequence. He typed in the values from an earlier print out and then went down the hall to get a cup of coffee while the vacuum tubes and wires crunched their numbers. When
he came back he discovered that the print out of the new weather was completely changed. It bore no resemblance to the old print out. He was mystified as to what could have made such a difference.

After considerable effort he discovered the "problem". He had inadvertently
changed one of the numbers in the equation. The old number was .506127 and
he had typed in .506 because in the print out, to save space, the shorter number was given. The computer had .506127 in its memory, but the new weather run was launched on the shortened value. A thousandth of a difference in value should not have made such a difference in outcome, but it did. The result was so different that he was forced out of his familiar world and into what would later become called the strange world of Chaos theory. Because he had a strong mathematical bent he was able to track the
equations to their source and in a few short years helped launched a new science.

A computer created the possibility of tracking complex phenomenon and it would be the massive power of computers which would bring the science of

chaos into its current sophistication. Leibniz's machine has helped unseat Isaac Newton's cherished views of the universe. For in the world described by Chaos theory change and turbulence are constantly dancing around the edges of reality. The hard and fast determinism which Newton struggled so
hard to bring to the world is now showing signs of being only a limited way

of viewing the world.

And in a compound twist of irony these same machines are now poised to create havoc in the modern industrial world. The same trick of shortening which brought Lorenz to his discovery of Chaos Theory is literally creating
havoc in the world's computing grid through what is known as the millennium
bug. The shortened date fields won't roll over as the year 2000 comes. Without changing each and every date field in every computer on the planet
which is programmed with the bug, information, energy, food, fuel and money
may not move as it has. As the world comes back from its symbolic cup of coffee on Jan 1, 2000 it will be coming back to a vastly uncertain outcome.
A world perhaps on the edge of chaos.

Given that we have date with the chaos it would be good to understand some
of what this paradigm shift may be telling us. Here's a few possibilities from the language of Chaos Theory and a modest translation.

As change accelerates the possible outcomes reach a point where normal cause and effect breakdown.

Translation: Old patterns of control and dominance will fail as usual patterns simply stop working.

Certainty and control become unstable in a developing field of chaos.

Translation: If we rely only on certainty we will have a very hard time when chaos looms.

Multiple realities, simultaneous points of view and different worlds all may exist within the same time and space.

Translation: There will be many "solutions" and many "failures" all of which will be generated by the same global transition.

After a certain stage of bifurcation event basins appear which are the domains of the outcome.

Translation: When the predictable world begins to change there are distinct
areas of possible outcomes. You will be guided into these "domains" by the quality of your intention. If you collapse into fear, you will land in a fearful event basin. If you increase your creative capacity then you will join a basin of possible futures.

Systems in a state of disequilibrium can become highly sensitive to new information, experiment profusely and adapt quickly. Translation: Evolution
and growth occur most at the edge of chaos. A system on the edge of chaos is sensitively dependent on initial conditions.

Translation: This means that actions we take now, even small ones, can have
huge effects down stream. This also means that small, inconsequential actions, could effect large global changes in ways which are hard to visualize. (The classic image in Chaos theory is of a butterfly shifting its wing. This small change creates a minor turbulence which escalates across scale boundaries in unpredictable ways and is part of the transformation of weather which leads to a hurricane)

In chaos diagrams no point or patterns of points ever recur in exactly the same way and yet there is an new kind of order which can be seen if the scale of observation is large enough. (think snowflake, or leaf)

Translation: What may appear as chaos in the upcoming period may in fact be
evidence of a larger order, a grander sweep of history at work.

Isaac Newton, back in the 1600's, was determined to show that the orbit of
celestial objects obeyed strict laws of motion and were not influenced by some mysterious heavenly force. His need to establish order in the heavens
may well have been influenced by the chaos in the world about him. At a critical point in Newton's life the plague broke out in London and he fled to the countryside to escape the disorder and death. A year later the great London fire broke out gutting much of the city and making his return even more problematic. He had just finished a significant portion of his schooling and in the two years of enforced idleness he was able create order where before there had been unrest and disruption. He was able to present a coherent view of how the universe worked based on causality. His
discoveries helped transform the science and technology of his world and has left a legacy of cause and effect which influenced politics, commerce, philosophy and helped propel the western world into a mechanistic model of
universal functioning which offered the tantalizing hope that with enough effort an unruly world could be tamed.

Ironically that basic impulse to establish control led to the experiments of our meteorologist. He was wanting to create models of weather change which could help predict the outcome of natural events. If you are a meteorologist you have a pretty high incentive to get your models right because if you don't the public shakes its head and mutters about how the weather people are always wrong. There is large lesson to be learned in how
Lorenz dealt with the change in his cherished program. Instead of throwing

away the outcome as an annoying anomaly he realize that he had in his hands
a clue to how small changes can exert large scale transformations, more importantly he realized that he was being given the key to understanding the patterns of Chaos. In the face of large scale changes there is an understandable desire on the part of humanity to exert control. The other option, one exercised by the ancients numerous times, is to blame some

agency beyond human understanding for the effects which are taking place. Modern Chaos theory coupled with Quantum mechanics opens the door to a third option. One which is very helpful to understand when contemplating the speed of global changes unfolding before our eyes.

This option says that we are floating, stationary islands of streaming energy, embedded in a sea of much larger change. Think of the red spot on Jupiter. This planetary phenomenon has been observed for hundreds of years
and yet what it is a large hurricane which has managed to maintain its integrity in the midst of the maelstrom of a planet nearly becoming a sun. We effect and are effected, in a non-linear manner, by the global environment. Within the obvious world of cause and effect there is a stream
of possibility which verges on chaos. This creative edge mediates between differing layers of reality, from atomic vibration to the movement of the heavens. Within these boundary layers of chaos small changes can bring about large scale shifts.

Y2k is a classic example of this phenomenon. A simple act of deleting two date fields from the early computers has escalated, through an amplification of scale, into a global crisis. Who would have thought that the a seemingly minor computational decision in the early days of programming would blossom in to the most expensive and potentially dangerous problem since world war II?

There is an adage in many healing disciplines which states that where the symptom lies the cure is to be found. I believe that this is compellingly true in regards to Y2k. Y2k is a classic example of small scale change leveraging itself into a position to change the destiny of a planet. And so we should gather our courage and migrate towards the edge of chaos where

small acts can change possible futures. What does this mean in practical terms?

It means that instead of denying, arguing, grandstanding, crusading and fearing the phenomenon of Y2k we should move fearlessly into the edge of chaos which is opening before our eyes.

An analogy is helpful at this point. Imagine a stream of water coming from
a single source. As the flow of water begins the stream is quite happy to fall in a straight line towards the ground. As the flow increases it begins to swing back and forth in a pendulum like motion (Point attractor in Chaos
terms) as the flow begins to increase the pendulum action begins to swing into a circle (Torus attractor) and finally as more and more water begins to flow the simple motions breakdown into chaos. The science of Chaos actually has mathematically mapped out what are called bifurcations which
lead to more and more elaborate dynamic systems.

One more image is helpful as well. In speaking of the cascade from order to
chaos the theoreticians talk about strange attractors producing domain basins. A domain basin can be thought of as the probable area in which the flow of events gather. Think of a ball bearing rolling around in large bowl. Eventually the ball bearing will stabilize at the bottom of the bowl. This is a stable domain basin formed by a "strange" attractor. (The strange part comes because the geometry involved is non-Euclidean). In a complex system there can many possible attractors all competing to become the final
domain basin and the boundary between them is visualized as a saddle.

And before we leave this part of the discussion its worth noting that a crisis is the change in an attractor when its basin boundary is destroyed.

Our basin boundary is about to undergo a large scale shock. If the computer grid of the planet is not resilient enough then the attractor which has held our modern world experience together is about to change shape, big time. Viewed locally this can be perceived as catastrophic, but if a longer

view is taken the resulting chaos actually has implicit within its movement
the hint of a larger order.

The flow of ,money, industrial goods, services, medicine, politics and transportation can be thought of a stream of water. The system is stable as

long as the rate of flow does not overwhelm the structure. But what happens
when the structure breaks down? Then all kinds of new attractors appear as
the old ones collapse, new domain basins are created and destroyed.

Anybody who has had the occasion to live through a crisis may have discovered a curious fact: in the face of large scale change the best of humanity and the worst of humanity appears. And what is comforting is that
on the whole altruism and a sense of selflessness seems to be predominately
the response. In the recent floods in Texas people who had lost their own homes and were staying in shelters volunteered to be out helping others.

During World War I after the first few months of deadly trench warfare a strange event took place. On Christmas day, 1914, it dawned bright and cold, freezing the sea of mud which had been between the enemies. Spontaneously both side, allies and axis soldiers, spilled out of the trenches and gathered in the middle, exchanging gifts, playing soccer and discovering the humanity before them. The generals,reacting in horror of the implications of such a spontaneous act of generosity, forbade under the
threat of death such fraternization and so the war continued. But for one moment, in the midst of all that anger, hate and violence, a new force emerged.

It is as if there is a strange attractor called love which is lurking just behind the facade of our ordered world.

A friend of mine told me a story about being a door gunner in Vietnam. In the middle of the utter carnage of the war he witnessed an incredible act

of selflessness A copter had gone down and a white man was trapped in the
wreckage. The copter was burning and no one was willing to risk their lives
to rescue him. Suddenly from the ring of observers a black man broke through the flames and pulled the man from the flames. My friend described

the moment as feeling like an angel's wing had just passed by.

A strange attractor took over.

Isaac Newton spent his life struggling to find order in the universe. One wonders what might of happened to history of science and the world if there
had been a bit more kindness and compassion in his personal life. Would an open heart have helped move him beyond mere determinism? We are having an
opportunity to find out the answer to that question. The causal relationship between many aspects of our world is under threat from the dynamics of change. If we try to cling to the old order then we will be whipped about like the last person in a chain of people on the move. In this scenerio the sum total of the energy of the moving snake of people is communicated down the line and sends the final person flying.

There is an emerging sense that on many fronts, from the economy, to global
weather, to pollution, to political instability, to technological weakness that complex systems are spinning out of control. We can contract in fear and try to exert control over forces we do not understand or we can hold to
the philosophers stone in the middle of this change: in the heart of chaos is new possibility, unheralded opportunity and the capacity to transcend our small and petty self interest. There are domain basins of magnificence lurking just beyond our sense of global unease.

New networks of cooperation, fertile new ideas and technologies, more compassionate action, a revolution in political power, new business paradigms, medical "miracles" and a more livable planet may be just on the

edge of chaos.

And a minor little date change may be the butterfly wing which brings it all about. Is there not some elegance yet to be found in this universe?

Contact David La Chapelle at: dlachape@ptialaska.net

Article provided by:

Resilient Communities

For more information about us, visit our homepage at
http:///www.resilientcommunities.org

---------- Headers ----------

Return-Path: <73742.3523@compuserve.com>
Received: from rly-zb02.mx.aol.com (rly-zb02.mail.aol.com [172.31.41.2])
by air-zb03.mail.aol.com (v59.34) with SMTP; Wed, 02 Jun 1999 19:55:35 -0400
Received: from hpamgaaa.compuserve.com (ah-img-1.compuserve.com [149.174.217.154])
by rly-zb02.mx.aol.com (8.8.8/8.8.5/AOL-4.0.0)
with ESMTP id TAA06129 for <MBB1217@aol.com>;
Wed, 2 Jun 1999 19:55:34 -0400 (EDT)
Received: (from mailgate@localhost)
by hpamgaaa.compuserve.com (8.8.8/8.8.8/HP-1.4) id TAA27881
for MBB1217@aol.com; Wed, 2 Jun 1999 19:55:34 -0400 (EDT)
Date: Wed, 2 Jun 1999 19:53:57 -0400
From: "Judith A. Snow" <73742.3523@compuserve.com>
Subject: I recently posted this on the forum
Sender: "Judith A. Snow" <73742.3523@compuserve.com>
To: John via Marsha Barnett <MBB1217@aol.com>
Message-ID: <199906021955_MC2-77E1-B80@compuserve.com>
MIME-Version: 1.0
Content-Transfer-Encoding: 7bit
Content-Type: text/plain;
charset=us-ascii