

Creative Systems



Creative Systems


The Only Constant

All things are interconnected and interdependent across time and space. Existence is relationships among organisms each transforming from its birth until its death.

All things are born, mature, and they die...

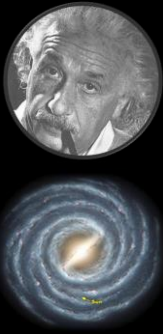
...individuals, social groups, species, and universes.

The only constant in life is change.

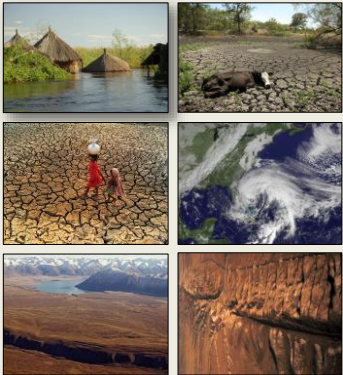


Einstein's Blunder

Even at largest scales of time and space, nothing is static: galaxies and solar systems rotate and the universe is expanding.



On a local scale, floods, droughts, hurricanes



Nature Behaving Badly



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Our time on earth is too brief...

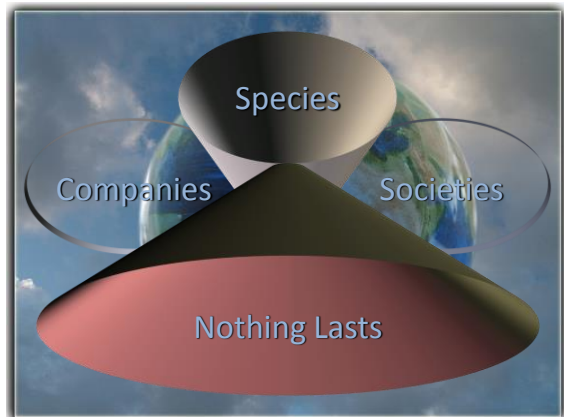
- ✓ Continents drift
- ✓ Mountains rise and fall
- ✓ Oceans become desert
- ✓ Climates warm and cool
- ✓ Plants and herbivores coming and going



Map of 'Pangea' with Current International Borders

Change isn't the exception to the rule, it is the only rule.






The average lifetime of a Fortune 500 company is less than half that of a human being.

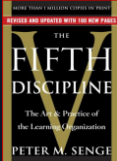


America's Largest Companies

Small businesses typically last only 3 to 5 years.



In most companies that fail there is abundant evidence in advance that the firm is in trouble.



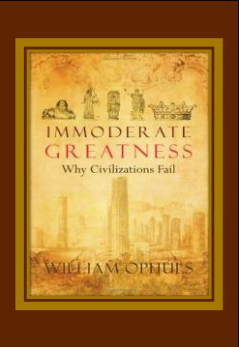
THE FIFTH DISCIPLINE
The Art & Practice of the Learning Organization
PETER M. SENGE

This evidence goes unheeded, however, even when managers are aware of it.

The organization as a whole cannot recognize impending threats, understand the implications of those threats, or come up with alternatives.

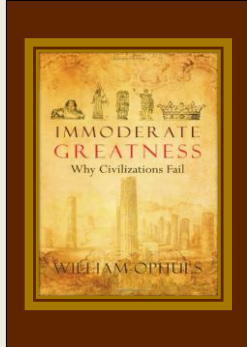


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Human civilizations typically last ten generations, roughly 250 years, as they evolve through five stages.

Pioneers - Enterprise, Initiative
 Commerce - Commercial Prowess
 Affluence - Rich, Soft, Welfare
 Intellect - Quantity trumps Quality
 Decadence - Corrupt, Unjust



Biophysical Limits

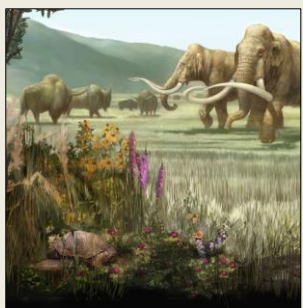
↕

Human Error
 Practical Failure
 Moral Decay

↕

Excessive Complexity

Plant and animal species have lifetimes of a few million years. Paleontologists tell us that 99 percent of the species that have lived on earth are extinct.





All compounded things are impermanent.

Like a star, an optical illusion, or a flame,
 A magical illusion, a dewdrop, or a bubble,
 Like a dream, a flash of lightning, or a cloud,
 So should one consider all compounded things.

Sutras

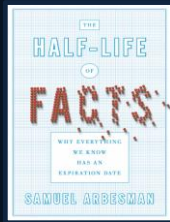
Complex Creative Systems

Prior to the seventeenth century...

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There is no absolute truth in science. All concepts and theories are limited and approximate. Science is a quest for understanding, an attempt to account for phenomena. But science cannot be perceived as "true" or "final" in any absolute sense.



It is a tentative organization of working hypotheses that, for the moment, best account for facts concerning biophysical processes whose interconnections are the fabric of a web characterized by change.

Our Western culture teaches us to think and behave in linear, hierarchical ways, continually attempting to impose order.



We are taught to think in ways that are cognitive, rational, and analytical.

But there is no one central controlling force, no top-down control.



Rather, a colossal number of agents ever interact and create relationships with one another and to their local environments. Highly complex orders ever emerge and transform from their interactions.

A holon is a unique entity when viewed from its constituent subsystems, for instance an individual from the perspective of an organ or an organ from the perspective of a cell.



But from another vantage point, a holon is part of a larger system, for instance an individual as a member of a social group and a social group as a component of a landscape.

Creatures transform as environments change.



According to Darwinian Theory, species change as genes with survival value are passed to the next generation.



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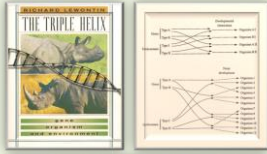



Organisms create relationships among what they deem are the relevant facets of the social and biophysical worlds they inhabit.

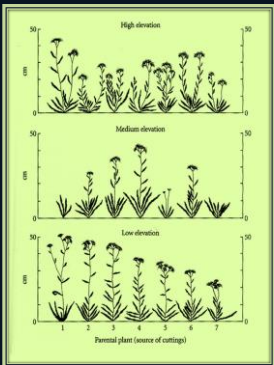


Nature fills vacuums with individuals and no two are alike.
Nature Abhors Sameness!

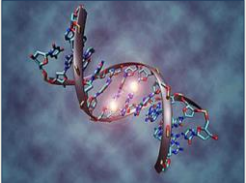
Genes + Environments + Chance = Individuals


Plant form, function, and behavior ever express in new ways as the environments plants inhabit change.



Epigenetics, heritable changes in gene expression caused by mechanisms other than changes in the DNA sequence, illustrates the...



...temporal and spatial dynamics of these ongoing interrelationships.


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We should take our views of genetics and evolution beyond how organisms developed from earlier forms to include changes occurring within the lifetime of individuals.




Individuals are *involved* in the world, which allows them to *evolve* with the world.

By engaging in ways that cultivate and affirm creativity in all organisms, we influence change, though our actions inevitably cause outcomes no one anticipates...




...because we do not know enough to foresee, because the world responds to our actions in ways no one expects, or because we are unable to evolve with the changes we help create.

The irony is that the environments organisms and organizations inhabit are changing because the creatures themselves are modifying their surroundings in ways that benefit others to their own detriment...




...and their running in the same direction only makes matters worse.

As organisms "run" they initiate downstream effects...





...that emerge days, weeks and even years later...

"The same interaction" may yield one result on one day, but a quite different result the following day, so we cannot know with certainty how the system will respond.



Any modifications we make to the system will thus produce results we cannot anticipate or predict in advance.

Life is an ongoing series of bifurcations in the face of varying degrees of uncertainty.

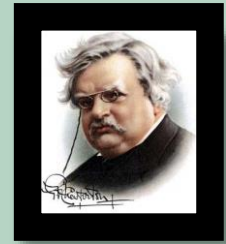



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Behavior at bifurcations depends on history, necessity, and chance.



The real trouble with this world of ours is not that it is an unreasonable world, nor even that it is a reasonable one. The commonest kind of trouble is that it is nearly reasonable, but not quite. Life is not an illogicality; yet it is a trap for logicians.



It looks just a little more mathematical and regular than it is; its exactitude is obvious, but its inexactitude is hidden; its wildness lies in wait.

Predicting Wrongly

- ✓ Sixty million Americans will die of starvation in the 1980s.
- ✓ Forty thousand species will become extinct each year.
- ✓ Half of all species on earth will be extinct by 2000.

With so many past failures, you might think prognosticators would become more cautious...



...but we simply change our signs, set new dates, and move to a different street corner.

We dismiss earlier errors as bad thinking by people less knowledgeable and then confidently embark on new blunders of our own.

We don't understand complex systems except in a general way. Whenever we think we understand them, we learn we don't.



We simply interact with them, and adjust our behavior accordingly, based on whatever feedback we can gain.

**Declaring Wars
Nothing to Save**

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We resist change by declaring wars and fighting battles against anything that threatens constancy under the guise of "saving the world."

To do so, we focus myopically on an enemy, ignoring the interdependent, ever-changing nature of 'reality.'

Yet, there is nothing to save, just the self (ego) grasping for power, control, and permanence, in a universe of impermanence.

Wildlife Biology

Range Science

Ecology

Based on How Life Used to Be

Nutrition Science

Climate Science

Native Species Pristine Places

Synecology, Pristine Areas Relict Sites

Range Science and Management

Ecology is based on the same notions: nature in the absence of humans is pristine and unspoiled.

Through our actions we've disrupted the "balance of nature"

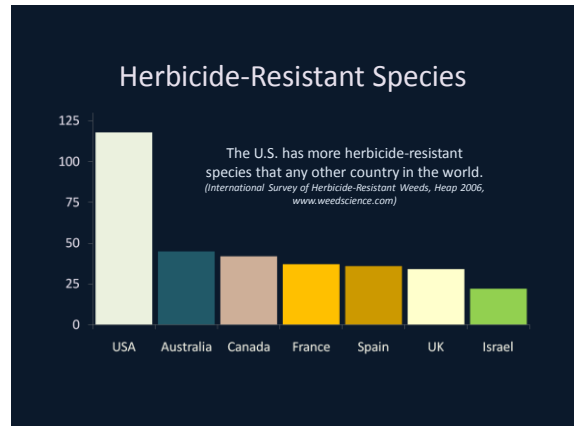
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The War on Invasive Species

INVASIVE SPECIES:
They Don't
Belong Here

by Teri Dan McLean

- ✓ 50,000 species
- ✓ Rising in the U.S.
- ✓ Spend \$120 billion/yr
- ✓ Few positive results



Pleistocene North America

What is native?

We interpret snapshots of times past as “the way things always were and always should be” without appreciating we are photographing moving targets.

If we'd been here when species now “native” were invading, what would we have done? Yesterday's invasive species are today's new natives and tomorrow's relicts.

Things never were the way they were, and they never will be again...

Ways to Turn Weeds into Resources

Manage Grazing

Develop Locally Adapted Livestock

Herd with Grazing Circuits

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The War on Cancer



Since 1971, when President Nixon declared the “war on cancer,” the United States has spent well over \$200 billion for research on cancer.

A report in the journal *Nature* suggests scientists and drug companies haven't won the war. Much of the research is unreliable.



Researchers at Amgen Inc. and the MD Anderson Cancer Center tried to replicate what are considered landmark discoveries for cancer.

The evolution of normal cells into cancer cells is an amazing display of life ever mutating, evolving, and ultimately consuming itself and its host.



In the end, cancer genome sequencing validates a hundred years of clinical observations. Every patient's cancer is unique because every cancer genome is unique.

“It was like watching someone locked in a chess game. The illness acted; she reacted. It was a morbid, hypnotic game—a game that had taken over her life.”



“She, too, was like Carroll's Red Queen, stuck pedaling furiously just to keep still in one place...”

“Germaine seemed that evening to have captured something essential about our struggle against cancer: that, to keep pace with this malady, you needed to keep inventing and reinventing, learning and unlearning strategies.”

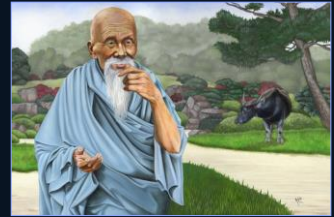
“Germaine fought cancer obsessively, cannily, desperately, fiercely, madly, brilliantly, and zealously—as if channeling all the fierce, inventive energy of generations of men and women who had fought cancer in the past and would fight it in the future.”

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“She had deployed every morsel of energy to the quest, mobilizing and remobilizing the last dregs of her courage, summoning her will and wit and imagination, until, that final evening, she had stared into the vault of her resourcefulness and resilience and found it empty.”

If you realize that all things change, there is nothing you will try to hold on to. If you aren't afraid of dying, there is nothing you can't achieve.

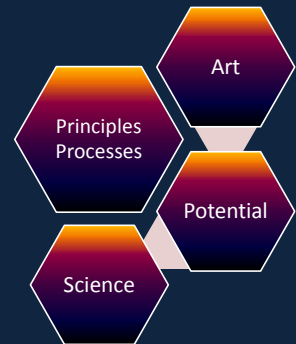
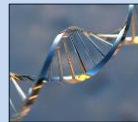
Lao-tzu, Tao Te Ching



Trying to control the future is like trying to take the master carpenter's place. When you handle the master carpenter's tools, chances are that you'll cut yourself.

Lao Tzu, Tao Te Ching

When Art and Science Meet



Good bread—bread at least as nutritious as anything you can buy in the grocery store and certainly tastier—is within the reach of anyone willing to undertake the making of it at home...



If you can bring yourself to relish the process, you have the makings of a baker.

Scientists and practitioners must not confuse principles and processes with their endless manifestations, all uniquely emerging in space and time as climate, soil, plants, herbivores, and people continually transform within particular ecological, social, and economic contexts.

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When researchers conduct grazing trials, they move away from attempting to develop principles and understand processes to implementing practices that depend on how they conduct their studies.

Researchers become managers: the questions they ask and the ways they design, implement, and interpret their "studies" all influence outcomes.

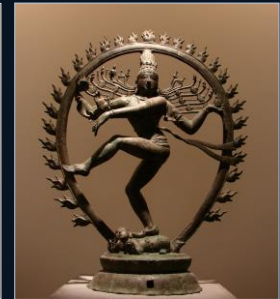
In practice, a manager must continually evolve within prevailing ecological, economic, and social conditions. They do so best by linking understanding of the processes of nature with the flexibility to respond to ever-changing social and biophysical environments.

The new physics cogently explains there is no objective reality out there waiting to reveal its secrets. There are no recipes or formulae, no checklists or advice that describes 'reality.'

There is only what we create through our engagement with others and with events. Nothing really transfers; everything is always new and different and unique to each of us.

In this realm, there is a new kind of freedom, where it is more rewarding to explore than to reach conclusions, more satisfying to wonder than to know, and more exciting to search than to stay put.
Meg Wheatley

Endless creativity in the universe is real, but it comes at a cost: the price of admission is endless transformation. The most interesting aspect is this universe lives by consuming itself.



From death comes life
and endless transformation

