

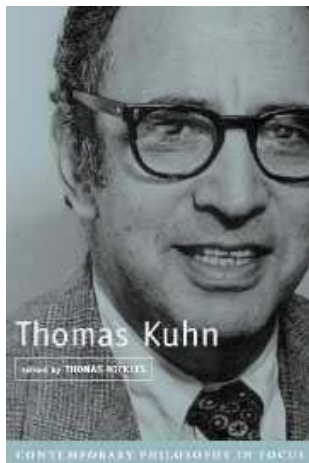
Scientific Theories Suggest a Light at the End of the Tunnel

Thanks to a cluster of new scientific theories, it is now possible to fathom that the bad times we're going through are actually very good times. The theories, largely unreported in the American press, are affirmative, simple, and mind-freeing. They include insights like these:

1. Everything that lives is in a constant state of movement and change. Periods of stability are only relative and are less worth studying than the *process* of change which is always going on beneath any momentary calm.
2. Everywhere, a period of decline is merely a cyclical phenomenon which leads back to rebirth and new life.
3. This death and rebirth seems always toward growth, toward a higher-and-higher Darwinian level, beyond mere survival and into levels of greater complexity and sophistication.
4. As higher levels are reached, there occurs an *acceleration* of change: the death and rebirth of organizations, societies, and lifestyles happen at an ever-faster rate.
5. The pace would probably be fatal, except for one additional theory: our image of what it means to be a human being is giving way to an exciting new image of *routine* human potential far exceeding present imaginings.

All this implies an accelerated evolution, but such acceleration is natural -- and it's a lot more stable and predictable than those temporary fixed points we used to think of as "real." We've spent all our time studying cocoons rather than the caterpillar-to-butterfly process which endlessly repeats itself throughout nature at ever-higher levels. That's the heart of four of the most exciting new theories to emerge. Each one touches on it, but not until they are abridged and synthesized, as this brief article will attempt to do, does it become clear that there is affirmative structure and rationality underlying what has so far seemed to be one of the most unstructured and irrational periods in modern history.

And now, the theories!



The Theory of Thomas S. Kuhn

Thomas S. Kuhn was a History of Science professor at Princeton when he wrote *The Structure of Scientific Revolutions* in 1973. Now at MIT, Kuhn is a pleasant, intensely serious researcher.

Kuhn's theory is not a true scientific breakthrough like the three others that will follow. But it is such a simple, enlightening tool to understand how change occurs in science that it creates the context for a deeper appreciation of the other theories.

Kuhn's main finding was that the scientific community, at any point in time, shares a common world-view, a reality concept, a *paradigm*. He found that a dominant paradigm (for instance Newton's Law) always exists during each scientific period and provides the basic structure within which all scientific thinking and experimenting are done. Thus, all experiments tend to support and entrench the dominant paradigm of the moment.

But, of course, there is always a possible new paradigm a-building, and when a new and better paradigm begins to emerge, scientists welcome the chance to verify it with rigorous and creative experimentation. Right? Wrong!

Nothing, it turns out, is more threatening to the leadership of the scientific community than the thought that the dominant paradigm is failing. As quickly as possible, senior scientists sweep under the rug any new idea which even suggests that the old paradigm isn't working anymore.

So how does the New Paradigm break through the logjam of existing thoughts and beliefs, grimly held together by an unyielding leadership?

In a surprising and exciting way: someone very wise (like Einstein or Galileo or Darwin) suggests an over-arching new concept so large, so poetic, so stimulating, so above the battle, that defending the existing ideas becomes less important than exploring the ideas suggested by the emergent paradigm.

Most of the ideas under the rug are taken out and tried in the light of the new paradigm. And most of them fit, indicating that in a paradigm shift, it is always more important to have a *change of vision* than to have a series of small, new ideas. Indeed, without the statement of a new dominant paradigm, new insights *will never* gain a foothold. The reason, once seen, is overwhelming: *The ideas supporting a new paradigm cannot even be explained or articulated in the language of the old paradigm.* (For instance: if you believe, with Newton, that the gravity which pulls on the apple under the tree is the one true constant, then things that can be proven using Einstein's new constant - the speed of light - cannot even be *explained* in any Newtonian laboratory or by the Newtonian mind-set.)

There is a growing belief throughout the industrial world, and even in all professions and institutions, that it may be time for a new social paradigm. For one thing, it's clear that our present institutions, in every field from education to politics to religion to business, have not absorbed the flood of new knowledge now available to them. They cannot do so, and still continue with their present forms and obsolete rituals. Thus, they daily grow more dinosaur-like, and lose the loyalty of their once-faithful True Believers.

Kuhn's theory, applied to society at large, strikingly confirms Toynbee's observation that all 26 civilizations which have existed throughout history perished for exactly the same reason - they guarded the paradigm which once made them famous far longer than they should have, and eventually cracked from the rigidity which accompanied their refusal to yield to new concepts.

Almost all major current thinkers acknowledge that a new paradigm is now due. And thanks partly to Kuhn's insight, we now know that major new truths don't come from the drip, drip, drip of tiny new "truths" being added to old truths. Rather, major change occurs with a leap to a *new level of perception*. This perception usually comes from an overview which realigns thinking into a new and more enlightening framework.

All of which brings us to:



The Theory of Ilya Prigogine

Ilya Prigogine is a Belgian chemist. He won the 1977 Nobel Prize for a theory which, like Kuhn's, suggests paradigm-shift parallels in other fields. Even the staid Nobel committee called it "poetic."

His theory says that everything alive *is surprisingly alive* - and on a twitchy, searching, self aware, self-organizing, up-ward journey. Such living systems periodically break into *severe* twitchiness and appear to fall apart. They aren't. It is actually at such vibrating times that living systems (humans, chemical solutions, whole societies) are shaking themselves to higher ground.

Prigogine has further advanced the startling idea (first gathered from observations of complex chemical solutions) that *transition* to a higher order is *universally* accompanied by turbulence or, to use Prigogine's word, "perturbation." He says that the disorder and disharmony in any chemical solution (or any society?) is a *necessary* activation of growth to a higher level. Prigogine sees the familiar evidence of decline as the actual harbinger and stimulant of change to a higher order!

Thus, living things, always unstable even in good times, will occasionally go into extreme fluctuation and perturbation and appear to be falling apart. Take heart: this is an even *better* time! The apparent disharmony is the way that every living thing re-jiggles itself into new combinations and permutations for ever-higher, ever-newer levels of development.

Prigogine has even more exciting news: he says that the greater the turbulence and the more complex the solution (or society), the greater the jump to a higher order! Further, he reports, the process accelerates with greater sophistication: the more complex the chemical solution (or society), the more often it will go into apparent disharmony in order to re-jiggle itself to an ever-higher level.

All of which suggests that this is more than the human being can handle. And it might be so were it not for another exciting idea developed simultaneously, by two scientists, unknown to each other, in two different disciplines in two different countries!



The Theory of Karl Pribram and



The Theory of David Bohm

Karl Pribram is an innovative scientist whose skills range across a wide group of disciplines and achievements. He is a neurosurgeon, a psychologist, a neurophysiologist. He has been the head of his department at the Stanford University College of Medicine, and he is everywhere respected for the quality of his research. His surprising theory gains credence from his own personal reputation, and the fact that it dovetails with the equally-respected thinking of David Bohm.

Bohm is an English physicist and mathematician whose work is of such a high order that, while a younger man, he was a protege of Albert Einstein. He is now a professor at the University of London and, like Pribram, is everywhere regarded as a world-class scientist.

Pribram and Bohm began at opposite ends of reality: Pribram with the structure of the brain and the workings of the mind, and Bohm with the underlying structure of the universe and reality itself -- and they met each other in the middle.

The theory itself is a knockout, and surprisingly relevant to Prigogine-type thoughts. For both the brain and the universe exhibit several of Prigogine's requirements for an evolving, self-organizing system:

1. The brain is complex - nature's most complex organ.
2. The brain, an endlessly fluctuating medium, seems capable of "perturbating" itself into higher-order realms.
3. The brain, in fact, meets all of Prigogine's requirements for triggering its own evolution! (Prigogine said that the more complex a system, the greater its potential for transcendence.)

Most people find it hard to believe that every culture since primitive times, including our own, has deliberately limited the brain's function. But, once seen, the reason for limitation is obvious: the brain is capable of such flights of fancy, that every culture has reminded us that we have work to do. Aldous Huxley and the English philosopher C.T Broad put it best: "As man is an animal, and needs primarily to survive, he has used his brain to screen out those things which do not directly contribute to his survival."

Perhaps that time is past. With broad social contracts now covering life-threatening situations, with electronic devices now taking over routine mental tasks, it may now be possible to free the individual and his brain for new and higher roles.

And the brain is ready and able. So say Bohm and Pribram. Their separate thinking began something like this: Pribram developed the insight that the brain is like a hologram. Meanwhile, Bohm came to the conclusion that the universe is like a hologram. They both said "Aha" -- the brain is a holographic instrument interpreting a holographic universe!

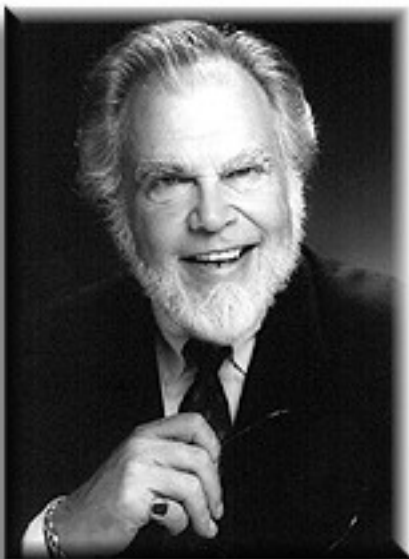
So, what's a hologram?

A hologram is a form of lenseless photography that uses laser beams. A hologram does two interesting things:

1. It interprets apparently-meaningless swirls and reconstructs them as a three-dimensional picture;
2. Surprisingly, it can reconstruct the whole picture from any fragment of the apparently meaningless swirls!

Bohm says that the universe is made up of those swirls; Pribram says that the brain can reconstruct them just the way a holographic instrument does! This means that the brain is far more sophisticated than anyone had ever realized: Maybe the brain operates in dimensions so beyond the conventional five human senses that it actually 'throws a bone' every day to our regular senses so they can have a 'reality' to live by. Possibly the brain operates even beyond our current paradigm of time and space: it is a many-dimensional instrument at ease in more than the three-dimensional world we now live in. Our brains mathematically construct 'concrete' reality by interpreting frequencies from another dimension, a realm of meaningful, patterned reality that transcends time and space. The ramifications of Bohm and Pribram extend into every field from theology to psychotherapy, biology, philosophy and evolution.

And finally, on to:



The Theory of George Land

George Land's commitment to the broadest ranges of General Systems Theory makes him indifferent to normal academic disciplines and priorities, endearing him only to those who can transcend the trivia of educational tribalism. Fortunately, this is a description of Margaret Mead -- who was so moved by what she called George Land's "brilliant synthesis" of evolutionary change that she invited him to be a member of the Tarrytown Group in its earliest days.

What is his "brilliant synthesis?" It's so special that it includes, sometimes in advance of their own thinking, parts of Kuhn, Prigogine, Bohm, and Pribram.

Land asks large questions: If Darwin identified survival as the key to the *Origin of Species*, what is the role of advanced societies whose mere survival is no longer enough of a challenge to provide the main fuel for species development? Answers Land: the main purpose of all life -- but particularly in the advanced industrialized nations -- is toward growth, toward higher and more complex levels of individuality and organization.

Q: (Tarrytown Letter): Isn't this an odd turn for the human journey to take?

A: No, it isn't a turn at all. Throughout nature, from the beginning, there has everywhere been the urge to grow to higher levels: single-celled creatures become multi-cellular, fish crawl ashore and learn to fly, apes stand erect and learn to talk...

Q: Are you saying that there is a common drive in all living things to grow?

A: Absolutely. Crystals and body organs and living organisms and religions and nations and supra-national organizations all -- have almost exactly the same growth pattern.

Q: Can you describe it?

A: It's a simple, three-stage progression. The first stage is self-oriented and accretive -- it defensively gathers everything to itself, like a baby does; the second stage is replicative and tries to endlessly duplicate those things that seem to work for it; the third stage is the most mature and the most mutual -- problems and rewards are shared.

Q: That's it?

A: Except for one thing: the pattern repeats and repeats, always at higher levels.

Q: What causes it to end its highest phase and go back to the first stage to start again?

A: Two things. First, it gets so good at understanding what works for it that it uses up its support environment; second, it goes into disharmony.

Q: Isn't the process of disharmony destructive?

A: It's de-structuring, but not destructive. The de-structuring is to make way for an upward change.

Q: Is America currently de-structuring?

A: Yes, but so is the entire industrial world. America and Russia are in the same boat: Poland is to Russia what Chrysler is to the U.S. -- evidence of a growing disharmony of function. And the same thing is happening in Europe and Scandinavia.

Q: This is good?

A: It's inevitable: decay is the handmaiden of creation. The death of an era is as sad as the death of a grandfather - and just as inevitable. But it's less important than the birth of a grandson, or an era. Death and rebirth, everywhere in nature, are the way static equilibrium is avoided - which would really be permanent death.

Q: So what was so bad about the industrial world that it has to be replaced by a new and higher order?

A: Nothing was so *bad*: it served its purpose by raising the standard of living, the standard

of research, the standard of education to such a high level that people began asking higher-level questions. And, of course, the industrial age began to use up its environment and go into disharmony - two signs that its time is nearing an end.

Q: So what's the higher order that might emerge in a new era?

A: Only time will tell for sure; we will have to go through that annoying basic phase again.

But there seem several higher-order yearnings that are trying to wedge themselves into the present industrial world.

Q: Such as?

A: Such as a return to a more human scale: the industrial world works well for large, centralized industrial plants, large banks, hospitals, educational systems. People don't work as well in such a scene - they feel diminished and dehumanized. There's a yearning to return to the small-scale of village life, or at least some modern equivalent.

Q: What else?

A: Additionally, the industrial world required that we all take fractional jobs as professionals or technicians, skilled in some small aspect of the giant mega-system. We are just beginning to realize that this has made us all pretty fractional as people, too. There is a yearning for wholeness everywhere.

Q: Anything else?

A: Let me name two things:

1. Both capitalism and communism exist to serve *production* goals – as though more bathtubs, more cars and more TVs were to forever be the purpose of the human journey. It may be time for a new economic system and a new political system that recognizes how gross it is to use the Gross National Product as a goal. Why shouldn't GNP measure Gross National Pleasure? Or Gross National Purpose? Measuring production alone no longer seems an adequate goal. As further evidence of this, it becomes clear that such a pursuit is (a) using up the environment and (b) going into perturbation.

2. Further, the industrial world is insensitive and based on hard, antagonistic competition. A person can rise to the top in the industrial world and never satisfy his human needs for caring and nurturing. Indeed, such feelings get in the way.

Q: How would you summarize?

A: I'm saying that all the new theories about new brain capacities are making each of us into an agent of not only change, but of transformation. Indeed, we must grow or die.

END of The Tarrytown Letter article from March '82

APPENDIX: from various websites, 7 Nov 04

Thomas S. Kuhn

Professor Emeritus Thomas S. Kuhn, the internationally known historian of science and philosopher, died Monday, June 17, 1996, at his home in Cambridge. He was 73.

Kuhn was the author of *The Structure of Scientific Revolutions* (1962), a seminal work on the nature of scientific change and was widely celebrated as a central figure in contemporary thought about how the scientific process evolves. The *New York Times* credited Kuhn's book with popularizing the word "paradigm" because it appeared so frequently.

Vice President Al Gore, in his June 7, 1996, commencement address, used Kuhn's theories to frame his argument about the relationship between science and technology. "Well-established theories collapse under the weight of new facts and observations which cannot be explained, and then accumulate to the point where the once useful theory is clearly obsolete," he said. As new facts continue to accumulate, a new, more accurate paradigm must replace the old one.

More than one million copies of Kuhn's 1962 book have been printed. It has been translated into more than a dozen languages and is still a basic text in the study of the history of science and technology.

Jed Z. Buchwald, the director of the Dibner Institute for the History of Science and Technology, said Kuhn "was the most influential historian and philosopher of science of our time. He instructed and inspired his students and colleagues at Harvard, Berkeley, Princeton, and MIT, as well as the tens of thousands of scholars and students in his own and other fields of social science and the humanities who read his works."

Kuhn joined MIT in 1979 from Princeton University. At MIT, his work has centered on cognitive and linguistic processes that bear on the philosophy of science, including the influence of language on the development of science.

From 1982 to 1991 Kuhn held the Laurance S. Rockefeller Professorship in Philosophy. He was the chair's first holder. Kuhn retired in 1991 and took the rank of professor emeritus.

Focus moved to history of science

Born in Cincinnati in 1922, Kuhn studied physics at Harvard University, where he received the SB (1943), AM (1946) and PhD (1949). His shift from an interest in solid state physics to the history of science, was traceable to a "single 'Eureka!' moment in 1947," according to a 1991 *Scientific American* article.

Kuhn, the article says, "was working toward his doctorate in physics at Harvard University when he was asked to teach some science to undergraduate humanities majors. Searching for a simple case history that could illuminate the roots of Newtonian mechanics, Kuhn opened Aristotle's *Physics* and was astonished at how 'wrong' it was... Kuhn was pondering this mystery, staring out of the window of his dormitory room... when suddenly Aristotle 'made sense.' "

"Kuhn," the article said, "realized that Aristotle's views of such basic concepts as motion and matter were totally unlike Newton's... Understood on its own terms, Aristotle's physics 'wasn't just bad Newton,' Kuhn says; it was just different."

Kuhn taught at Harvard and at the University of California, Berkeley, before joining Princeton in 1964. From 1978 to 1979 he was a fellow at the New York Institute for the Humanities.

Ilya Prigogine

Ilya Prigogine was awarded the Nobel Prize in chemistry in 1977 for his contributions to nonequilibrium thermodynamics, particularly the theory of dissipative structures. He was born in Moscow, Russia on January 25, 1917. He obtained both his undergraduate and graduate education in chemistry at the Universite Libre de Bruxelles. He was Regental Professor and Ashbel Smith Professor of Physics and Chemical Engineering at the University of Texas at Austin. In 1967, he founded the Center for Statistical Mechanics, later renamed the Ilya Prigogine Center for Studies in Statistical Mechanics and Complex Systems. Since 1959, he was the director of the International Solvay Institutes in Brussels, Belgium. In 1989, Prigogine was awarded the title of Viscount by the King of Belgium. He was a member of 64 national and professional organizations, among which are the National Academy of Sciences and the American Academy of Arts and Sciences. The most recent of Prigogine's many international activities were Special Advisor to the European Community in Brussels, Belgium and Honorary Member of the World Commission of Culture and Development of UNESCO, chaired by Perez de Cuellar.

The main theme of the scientific work of Ilya Prigogine was a better understanding of the role of time in the physical sciences and in biology. He contributed significantly to the understanding of irreversible processes, particularly in systems far from equilibrium. The results of his work on dissipative structures have stimulated many scientists throughout the world and may have profound consequences for our understanding of biological systems.

Prigogine received numerous national awards and prizes, including the Golden Medal of the Swante Arrhenius, Swedish Academy; Rumford Gold Medal, Royal Society of London; the Descartes Medal, Paris; Commander of the Legion of Honor, France; Imperial Order of the Rising Sun (Gold & Silver Medals), Japan; Medaille d'Or, France; Russian International Scientific Award, First "N. N. Bogolyubov Prize," Joint Institute for Nuclear Research, Dubna; Medal of the President of the Italian Senate, awarded by Pio Manzu International Research Center, Italy; Norbert Wiener Gold Medal of Ukbridge; Medal of Member of the European Academy of Yuste; Silver Medal of V.I. Vernadskiy, the Academy of Natural Sciences of Russia and Commander of the World Order "Science. Culture. Education." European Academy of Information, 2002. He received 53 honorary degrees.

Recent books

Is Future Given? World Scientific, Singapore 2003

The End of Certainty, Time, Chaos and the New Laws of Nature
(with I. Stengers) The Free Press, New York 1997

Exploring Complexity (with G. Nicolis) W. H. Freeman & Co., San Francisco 1989

Order Out of Chaos (with I. Stengers) Bantam Books, New York 1983

From Being to Becoming: Time and Complexity in the Physical Sciences
W. H. Freeman & Co., San Francisco 1980

Self-Organization in Non-Equilibrium Systems: From Dissipative Structures to Order Through Fluctuations (with G. Nicolis) J. Wiley & Sons, New York 1977

Nonequilibrium Statistical Mechanics Wiley-Interscience, New York 1962

Dr. Karl Pribram

Karl Pribram (born February 19, 1919 in Vienna, Austria) was trained as a neurosurgeon. A long time professor at Stanford University he did pioneering work on the elucidation of the cerebral cortex. To the general public he is better known for the holonomic model of the functioning of the brain. The holonomic model assumes that the information is stored not in cells but rather in interference patterns. His other contributions include a quantum approach to neurophilosophy.

Dr. Karl Pribram is one of the world's leading cognitive neuroscientists, and he is viewed as one of the founding fathers of the cognitive revolution in Psychology. We are fortunate that he has recently moved to the Georgetown community and we are honored that he has accepted an appointment as Distinguished Research Professor in Psychology and Cognitive Science. He will likely be teaching one course each semester through the Psychology Department, and Cognitive Science will cross list his classes. This offers Georgetown students a remarkable opportunity to study with one of the founders and leaders of Cognitive Science.

Asked to summarize briefly his research interests:

"My interests are focused on cerebral function as it relates to psychological processes. I am especially concerned with the differences between the functions of the posterior convexity of the brain on the one hand, and its frontolimbic systems on the other. Briefly put, the convexity deals with locating us in space and time; the frontolimbic formations monitor that experience to create a narrative about our existence. The substance of my research and theorizing is to provide data and interpretations as to just how our brains organize the psychological processes that make up "locating" and "monitoring"."

David Bohm 1917-1992

This interview with David Bohm, conducted by F. David Peat and John Briggs, was originally published in Omni, January 1987

In 1950 David Bohm wrote what many physicists consider to be a model textbook on quantum mechanics. Ironically, he has never accepted that theory of physics. In the history of science he is a maverick, a member of that small group of physicists—including Albert Einstein, Eugene Wigner, Erwin Schrödinger, Alfred Lande, Paul Dirac, and John Wheeler—who have expressed grave doubts that a theory founded on indeterminism and chance could give us a true view of the universe around us.

Bucking this tide of modern physics for more than 30 years, Bohm has been more than a gadfly. His objections to the foundations of quantum mechanics have gradually coalesced into an extension of the theory so sweeping that it amounts to a new view of reality. Believing that the nature of things is not reducible to fragments or particles, he argues for a holistic view of the universe. He demands that we learn to regard matter and life as a whole, coherent domain, which he calls the implicate order.

Most other physicists discard Bohm's logic without bothering to scrutinize it. Part of the difficulty is that his implicate order is rife with paradox. Another problem is the sheer range of his ideas, which encompass such hitherto nonphysical subjects as consciousness, society, truth, language, and the process of scientific theory making itself.



David Bohm

The son of a furniture dealer, Bohm was born in Wilkes-Barre, Pennsylvania, in 1917. He studied physics at the University of California with J. Robert Oppenheimer. Unwilling to testify against his former teacher and other friends during the McCarthy hearings, Bohm left the United States and took a post at the University of São Paulo, Brazil. From there he moved to Israel, then England, where he eventually became professor of physics at Birkbeck College in London.

Bohm is perhaps best known for his early work on the interactions of electrons in metals. He showed that their individual, haphazard movement concealed a highly organized and cooperative behavior called plasma oscillation. This intimation of an order underlying apparent chaos was pivotal in Bohm's development.

During the Fifties and Sixties Bohm expanded his belief in the existence of hidden variables that control seemingly random quantum events, and from that point on, his ideas diverged more and more from the mainstream of modern physics. His books *Causality and Chance in Modern Physics* and *Wholeness and the Implicate Order*, published in 1957 and 1980, respectively, spell out his new theory in considerable detail. In the Sixties Bohm met the Indian philosopher Jiddu Krishnamurti, and their continuing dialogues, published as a book, *The Ending of Time*, helped the physicist clarify his ideas about wholeness and order.

David Bohm on Meaning, Purpose and Exploration in Dialogue

(edited with permission from tapes of an August, 1990 conversation)

Communication has been ailing in the human race for a long time and Dialogue is concerned with that. But the primary purpose of Dialogue is not to communicate. It is much deeper. It addresses the blocks in communication, not merely to understand them, but to meet them directly. It is aimed at seeing resistances to communication. In Dialogue we are ready to raise topics serious enough to cause trouble. But while we are talking we are interested in being aware of what's going on inside us and between us.

The word "dialogue" has many meanings and we are giving it a particular meaning. In this Dialogue we are not trying to make our points prevail or, if we are, we need to look at that. Our challenge is to see when each of us is trying to prevail, because if anybody prevails it means the dialogue has failed. Or, if we simply agree, the dialogue may also have failed because this means that we haven't gone deeply enough into the process or into the consciousness behind it. What begins to transform culture into something quite different is that ultimately the frustration or anger or rage or hatred that arises can lead to a crisis in which these feelings are transformed giving rise to impersonal fellowship - to thinking together and participating as if we were one body - by establishing a common consciousness. The group then becomes a kind of instrument of consciousness which can function differently.

But we can't give the meaning in a nutshell. If everybody knew the meaning, we wouldn't need the Dialogue. The dialogue is not aimed at settling anything. We explore meaning together - the creative perception of meaning - thinking together and feeling together. But meaning is active. It is not merely sitting there. The consideration of this meaning may act - or it may not. The whole point of having the Dialogue is that we're not trying to produce a result. That's very important. It may never do it. Or it may do it at some moment when we least expect it. The seed has been planted. And the meaning is naturally, spontaneously active and transformative.

Dr. George Land

Author of: *Grow or Die* and *Breakpoint and Beyond* with Beth Jarman

Dr. George Land is an author, speaker, consultant, and general systems scientist with a broad and varied background in communications, business, education, and government. Dr. Land discovered the Transformation theory, a universal process of change and growth. These concepts have formed the core of management training for tens of thousands of managers worldwide including such companies as AT&T, 3M, IBM, and Dupont.

From these principles came George Land's unique strategic thinking processes for organizations as well as his invention of the first computer-assisted interactive approach to group creative and strategic thinking. His exceptional processes, called Conexus, is offered through an international consulting company which Dr. Land helped found. Conexus is now licensed by over five hundred major corporations and government agencies world-wide.

Dr. Land is author of *Grow or Die-the Unifying Principle of Transformation*. Originally published in 1973, and was submitted as Random House's nominee for Pulitzer and National book awards. His most recent book is *Breakpoint and Beyond-Mastering the Future Today*, which he co-authored with Beth Jarman, describes the foundational principles Dr. Land and Leadership 2000 use in their transformational consulting work with organizations.

Speaking Topics:

The Future Isn't What It Used To Be
New Rules For Today's Successful Leaders
Innovation For the Millennium