THE CASSANDRA COMPLEX: COMPLEXITY AND SYSTEMS COLLAPSE

Robert J. Brem
Department of "Politics"
College of Alameda
Program in Public Administration
CSU East Bay

Published (pp. 125 to 150) in: Morcol, G. and Dennard, L., editors (2000). New Sciences for Public Administration and Policy: Connections and Reflections, Chatelaine Press, Burke, VA.

***

By Way of Introduction

Human beings are attached to a large array of dysfunctional perspectives that have a profound impact upon the policy making process and the consequent social effects on people. Barbara Tuchman. (1984) calls it "folly" when policy is driven by un-necessarily distorted perspectives over time under the tutelage of succeeding administrations while there are people (who are systemically ignored) pointing out the dangers of these policies to the whole system. These ignored voices are often delegitimated as poor team players, negative "doomsayers," or to use a popular epithet of the past: Cassandras. Cassandra's foretell "doom" ala potential points of collapse in the current course of action. And in a society that glories in a "don't worry, be happy" approach to life, these people are silenced. This is unfortunate.

Collapse and instability in systems are normal from the perspective of modern physics, as opposed to the comforting progressive and invariant order and equilibrium posited in classical physics. Collapse and instability are in fact beneficial to long term systems vitality in a dynamic cycle of emergence, collapse, re-emergence. In this fashion, a process of evolutionary development takes place as systems change over time and adapt to new temporal and spatial realities. However, when the cycles and dynamics of emergent order, increasing complexity, bifurcation, and reordering are artificially stabilized beyond natural parameters, the potential for dysfunctional or catastrophic collapse is increased. With this perspective serving as background and context, this article explores two potentially dangerous problems inherent in American public and private culture.

First, it is characteristic of American attitudes to privileging of positive perspectives of the future while concurrently delegitimizing "bad-news" to the point of denial. The result is to silence important information which might be crucial in informing and shaping policy. Second, and related to the first, Americans have an over reliance and faith in certainty and linear progressive policies designed to maximize growth within a system whose "rules" are artificially maintained as "stable" (that is beyond reasoned calls for systemic change) even to the point of

absurdity in the face of evidence that such rules need be changed. This is done with an abstract faith in the notion that growth is always good and theoretically sustainable without end despite evidence from natural systems and daily life to the contrary.

The results of these dynamics in complex interplay over time is to magnify potentially beneficial collapse into a situation of potentially catastrophic systems collapse. The process whereby such policy streams are pursued and warnings of danger are systemically delegitimated is called here "The Cassandra Complex."

The name comes from the Trojan priestess Cassandra whose prophecies of doom were systemically denied, ignored, derided, and dismissed as the ranting of an overly pessimistic alarmist doomsayer. The moniker "Cassandra" has stuck to this day and is always uncomplimentary. However, what is always forgotten is that Cassandra was right. She prophesied the fall of Troy and the collapse of Trojan hegemony and culture. What would have happened had her advise to "beware Greeks bearing gifts" had been heeded by Trojan policy makers? Rather than the roots of Greek culture we recall, would we harken back to our Trojan roots? Such fanciful speculation aside, this article seeks to explore the proper role for looking at policy making in the future with an eye toward the inclusion of the potentiality of dark scenarios in our contemplations such that humans are better able to navigate these times of uncertainty by making better more adaptive policy choices.

There are no guarantees offered in this perspective. Rather, what is offered is no more than the idea that in embracing complexity and chaos rather than certainty and control, the probabilities of social transformation to what futurist Robert Theobald calls a "compassionate era" is increased. Freed of rigid boundaries of what is discussable, we may find out "just what humans really are capable of accomplishing" (Theobald, personal communication, 1996). This quest starts with the attempt to apply new ways of knowing to the enactment of public policy. It allows people to navigate what Theobald metaphorically describes as "the rapids of change" which describes the social context better than more control centered metaphors typical of more traditional world views common today.

Theobald offers the metaphor of the "rapids of change" as an alternative contextually more appropriate to older metaphors utilized to describe life until recently. In the past, Theobald argues, we lived by a number of river metaphors. First, we come to a river and find stones upon which to get across the river. Knowledge of where the stones are allows us to always pass over the river with undue concern. Then, come times of crisis when the ways of making it across the river are more problematic and the place of the stones or the energy of the flow of water shift from time to time. But we have faith that stones are there and each time we come to the river we look for them and, finding them, with skill we cross the river having overcome the obstacle with our methodological rigor and discipline. Finally, comes a time when not only are the stones unable to be found in a reliable manner, but we slip from the slippery banks of the river and are now negotiating the rapids. No longer is the river seen as an obstacle to be overcome. Rather, the goal now is to thrive while negotiating the rapids of change. We reach out and find debris and with this--as we are swimming for dear life–we try to build a raft upon which to find

moments of stability. Sometimes we are more successful than others and navigate the rapids quite nicely for a time. But this stability is only an illusion that we perceive and experience as real only until the pounding waves of change collapse our raft and we must begin anew this process of seeking new stability. And over and over this is the cycle of the times we experience. The rapids of change: emergent order, increasing complexity and the experience of stability for time, de-stabilization and collapse, and finally re-emergence of a new order. This is another way viewing the "postmodern problematique" wherein our cherished ways of doing things in the world no longer are found as helpful as once they were. Approaching governance with this metaphor as a backdrop allows the emergence of a different kind of policy making process better able to address the problems facing modern society as we enter into the twenty-first century. This is a suggestion that if we allow controlled chaos to reign with democratic values defining the parameters of acceptable policy and with all voices at the table (especially those we do not want to hear), more democratic and effective policies more appropriate to the realities of the times, described by Theobald, will emerge.

Wheatley (1992) notes such parameters do not define action within the system. Rather they define the boundaries beyond which action may not exceed. Within the system, self organizing complex dynamics allow an order to emerge. The parameters (values) within which the variables of the system may behave–and outside of which (values) they may not exceed--shape the eventual outcomes basin or emergent order. The more democratic the parameters shaping behavior within a social system, the greater probability that a democratic order may emerge. An integral part of this process is awareness that collapse is both natural and desirable in the process of human social development and that those who point out where policies may be taking wrong turns are at once helping us to avoid unnecessary collapse but also allowing us to know when it is time to work towards a natural collapse and reordering of the system to better meet the challenges of the times.

In this context, Zolo (1992) has looked at the increasing complexities of the modern world system and the increased chances of systems collapse these invite. He suggests a reordering of liberal democratic theory as applied in modern governance to be perceived as a system of governance responding in a temporally (historically) contextual and spatially (that is, geoculturally) appropriate fashion to enhance the prospect of its citizens pursuing their lives by values of life they themselves choose. That means accepting that what works in North America may not be appropriate for Malaysia. This perception of democracy includes limiting the parameters of policy (systemic behavior) such that they enhance the protection of civil rights, reduce factors that lead to preventable insecurity, and mediate unnecessary structural conflicts and barriers such that the probability of people being able to pursue life paths (in a manner meaningful to them) in the context of an ever increasingly complex social context is enhanced.

Complexity, Social Inquiry, and Public Policy

Daneke (1990; personal communication 1996) has suggested the initial excitement over the possibilities of the value of the new sciences in social scientific inquiry has begun to give way to

a more practical demand to offer up applied usage that show a clear differential from the manner in which social scientific inquiry thus far as informed the policy making process. Give us tools that work better is the implication of this line of thought or tell us why we should adopt this perspective in lieu of what we already do. It may be, however, that this request for tools– something usable right now today–is in itself a linear mechanistic phenomenon and part of the problem.

It is precisely this "here and now" perspective that has informed policy making in both the private and public sectors to act in a manner that ignores the possibility of unforeseen consequences in the long term–"there and then". Uncertainty and non-linear dynamics offers the caution that small unaddressed distortions here and now may have consequences in the long term there and then that will be 1) unpredictable, and 2) out of proportion in magnitude when compared with the initial distortion. This is the "butterfly effect" (Gleick, 1988). By its very nature--being unpredictable--there are few things one can do to build in practical applied tools into the policy making process to address this ambiguous state of affairs. Calling upon the lessons of structural analysis, Petroski (1994) discusses how, as structures grow larger and more complex, the causes of collapse are never-the-less consistently very small. An implication of this perspective is the futility in even seeking a highly accurate way in which to identify the specific small distortions in our calculations that will eventually lead to the chaotic consequence. In fact, it might be posited as a probability that the phenomenon our calculations identify as the distortion to be concerned with may not be the distortion that collapses the system (the straw that breaks the camel's back). The best we can do is learn from each collapse in subsequent design.

Traditional social science has this understanding present in the attempt to control for error in a multivariate regression equation, for example. It is the attempt to build into the calculations of social scientific inquiry an awareness of the place of such unforeseen consequences. However, Poincare's three body problem (Gleick, 1988) illuminates the problem with both Newtonian mechanics and a social science methodology based upon it. The notion here is that when looking at two bodies in relationship to one another, Newtonian mechanics can accurately make predictions about the behavior of each relative to the other. But add even one more body (that is, three or more bodies) and the ability to accurately predict breaks down: More bodies in relationship to one another and the less certain the accuracy. Another term for bodies could also be variables.

In society–the modern world system–the number of variables (bodies) and potential interactions and non-linear effects is infinite. So--in a social scientific inquiry too rigidly adhering to Newtonian assumptions--what the crucial "error" actually is and what its consequences are will be both non-linear and unpredictable. This might be posited as due the uncertainty-principle which renders certainty of place and motion (where a variable figures into our understanding and its implications in the system as a whole) impossible to grasp by the very act of observation and three-body problem manifest in the inter-relatedness of too many variables for which to accurately control. This is why the application of modern quantitative methods in policy analysis is only useful within severely constrained contexts and the details must always be filled in by less than precise and ambiguous discussion.

Social scientists know this but not all policy makers understand that at best you have probabilities, never certainty and most certainly never proof. In fact, ideologically driven policy makers deride anything but decisive and certain results always attacking any social science conclusions that differ from their self-serving agenda as "unscientific" or not scientifically proven as a justification for ignoring the recommendations of social scientists who are then summarily delegitimated as "liberals". But they engage in this hyperbole in the name of a form of scientific certainty that never has and never could exist.

Such policy makers act as if we can have certainty. The extent to which they, the public, and implementors of policy fool themselves with this myth of precision in calculations, to that extent are policies subject to an increase in the possibility (even probability) of catastrophic collapse. Langewiesche (1998) explores this dynamic in action in the ValuJet crash in 1996 or the Challenger disaster in 1987. The equipment did not fail, the human administrative systems failed. In part, this was due to too much faith in the precision and certainty of systems of oversight and redundant sign-off forms for various people in the preparation processes to ensure that nothing is overlooked.

What was overlooked in this process however was that it became routine and many people signed off out of habit rather than knowledge of actual compliance. The FAA regulator function was short circuited a mixed mission to both promote the airlines as a profitable business and to regulate their activities. Market concerns led to too few regulators and lenient attitudes in an effort to avoid intrusion upon the requisites of profit. Strict adherence to regulations is more expensive than loose compliance. The net numbed approach to compliance led to disaster.

We expect our precision oriented technological world to work. However, we do not allow for any questions of this because of our blind "can-do" faith in our systems–and underlying ideological commitments to never-ending progress and success--and the consequences in our policy calculations are often measured in terms of human misery. This is what Zolo (1992) argues democratic policy making ought to seek to minimize in an attempt to build Theobald's compassionate era of civilization in the twenty-first century.

Essentially, the concepts which distinguish a complexity based approach to a more traditional social scientific approach to framing public administration problems can be illustrated by looking at the fundamental principles of public administration such as predictability and control. Gulick's POSDCORB acronym (recounted in Stillman, 1991), sums up the traditional view of administration and politics so based. Planning, organizing, staffing, directing, coordinating, reporting, and budgeting from this perspective are the quintessence of administration from a world view which posits a knowable and predictable universe. Even though there is an acknowledgment of the concept of "probability" rather than certainty in Demming's TQM, it and public choice models of administration and politics (as represented by Osborne and Gaebler (1993)) represent further versions of this paradigmatic approach to governance. These models–based in what Lumley (1997) calls fabricative tangible results--work but are never-the-less incomplete models just as Newtonian mechanics is an incomplete model in physics. Not only

those things we can measure and see and feel have value. In fact, what Lumley calls dipolar valuable factors–the multitude of seemingly trifling human factors and ambiguities that make up the action in the day-to-day world of lived and shared reality--are not tangible in this fashion, but never-the-less are the plasma within which success or failure of a policy occurs. What a non-linear "new sciences" perspective offers is just this: perspective. Capra (1982) has suggested the crisis we face in the modern world is one of perception. To seek means of precision and control suggested by the request for practical applied tools is not what the new sciences have to offer the social sciences. In technology probably yes. In the social sciences probably no.

Whereas a more traditional approach to social scientific inquiry might focus upon the "certain" variables with an accounting for error, a more complexity based social scientific inquiry might focus more upon the error than the certainty recognizing the certainty as potentially more illusion than reality. It is this "noise"–the "error"–which is often ignored in policy formulation that is at the heart of the Cassandra Complex. The urge to privilege or legitimate the optimistic and certain perspectives in our lives and to actively silence and de-legitimate the uncertain and pessimistic voices as "noise". Ignoring this noise opens the door to the distortions in awareness--necessary to making competent policy--that lead to potentially catastrophic collapse of systems designed and enacted by such distorted policy making perspectives. The sign off dynamic in the Value Jet crash is an example. Questioning the veracity of claims made on the forms could be seen as a negative perspective; team players sign off to make everyone's job easier.

Inclusion of the noise allows policy discourse to more resemble the chaotic chorus of life in the lived world of shared experience. That is, it is necessary to specifically build into day-to-day practice the perspective that mistakes are normal and acceptable as qualities of being "human" and that questioning is a highly valued activity and not an impediment to good team dynamics.

The certainty of rational actor models of society is an illusion which in itself is a contributory causal link in the dysfunctional destabilization of society. This dynamic is magnified the more we face increasing complexity–evidenced by increased crime and economic flux--with traditional control oriented approaches to governance and administration while citing abstract indicators of progress–not rooted in real life experience of humans--as evidence of our success. That is to say, while the indicators of control oriented policy analysis suggest things are great, the experiences of people in the lived day-to-day world of shared experience suggests the exact opposite (Cobb, et al, 1995; Whitman, 1997). What this difference in experience and perception is, may be found in the unanticipated and ignored error and silenced delegitimated voices of modern day Cassandras in the discursive structure of modern American policy formation. Often these voices are ignored for suggesting unrealistic options because of a belief that only linear incrementalism works in policy making and implementation.

There comes a time when tweaking the old system incrementally–its structure of rules by which day-to-day social life is governed–is no longer a viable way to meet new realities of changing contexts. For example, there may be only so many things we can do to make the competitive market system in the United States and the world economy–with its roots in eighteenth century political and economic thought--still work in the early twenty-first century. The Asian and

Russian economic instabilities of 1997-98 may be evidence of this possibility. Ignoring the possibility that the system is ripe for being discarded may be at the root of why American society may seem under the influence of constant destabilization. Not that destabilization is bad. In fact, as we shall discuss below, it is natural and to be embraced.

However, efforts to stabilize the system beyond its useful life may be the roots of potential catastrophic collapse as the system tries to address problems it is simply not capable of addressing. That is to say, a winner-take-all society rooted in a cash-based competitive market that measures success merely by monetary dynamics (i.e. GNP/GDP) may now be more of a problem than a source of potential solutions which is why the economy can look good and everyone in it feel bad (Cobb, et al, 1995; Frank & Cook, 1995). This feeling may be a symptom of collapse dynamics in a system that does not work as well as it once was thought.
Collapse of Complex Systems

Tainter (1988) explores complex systems dynamics in the context of increases in social system complexity in societies. As the demands on the system increase and the capacity of the system to meet those demands decrease, societies attempt to meet these challenges in ever more reactive and decreasingly effective ways. In the process, social systems become more and more byzantine: complex beyond reason and decreasingly unable to meet the requisites of the times. In order to cope with the rapids of change, we make improvements (e.g. tweaking incrementally) in our systems of governance and management. This "new" system, though improved, remains the old system; one that once made sense in another context but now tends to become less able to meet the requisites of functioning in changing contexts. In the absence of external factors to relieve the pressure[1], instability increases the pressure for a phase shift leading to systemic collapse and reorganization into a new systemic order. Social systems are more prone to bifurcation and resultant phase shifts--systemic collapse preceding systemic self-reorganization--when they are no longer able to adequately meet the needs of society and ensure social cohesion.

The dynamics of collapse are referred to in complexity theory as bifurcation or a phase shift the order of a system. That is to say, as one outcome basin (the self-organizing order emergent out of the interaction of variables within a system's limiting parameters)--the old order of things--becomes more and more complex in response to changing context, it becomes unstable and the order starts to collapse. Such collapse allows for the emergence of new systemically self-organized order more appropriate to the current context and is a normal phenomenon (see Young, 1992, 1991a, 1991b).

The process of increasing complexity, instability, collapse, and reordering is natural. In humans it can be illuminated in the process Kuhn's paradigm shifts in science. Beliefs of yore no longer fit reality and only convoluted mental gymnastics allow old ways of believing to still work (e.g. Ptolemy's view of cosmology versus Koepler's versus Hawking's). The process here is complexification (to make the theory fit anomalies in the observations) , conflict (with the failure

1 The old Soviet Union may have served this function to the structure of the social order in the United States. Without the Soviets, the incongruencies on the American system may now be more explicit and able to act as destabilizing factors in the system.

to convince critics and continued nonfitting), instability (severe doubt and lack of confidence), and collapse (letting go of the beliefs as simply not fitting). The reordering is wherein what still works from the old is still used in the formulation of the new more elegant theory. Rather than being a phenomenon to be feared, it is a positive thing to be embraced as a part of evolutionary or natural growth.

However, people resist change and most often seek to maintain outmoded ways of being that become ever less relevant to the times and tasks at hand (Goldstein, 1988; Lumley, 1997). They seek to maintain the stability of the system artificially denying the inevitable phase shift. Senge (1990) sees this as akin to a learning disorder among the people who make up the organization and notes this as a prime cause of organizational systems failure. When the collapse comes, rather than being an uncomfortable time of change, it can be more catastrophic (harmful to the people in involved) than if otherwise allowed to unfold naturally (Funtowicz & Ravetz, 1994).

The potential harm comes when the system does not collapse when it ought but rather at a time far beyond this optimal time and the adjustment is that much more difficult and potentially catastrophic for the human beings involved. The harm can take many forms including catastrophic downsizing, pension plan collapse, corporate bankruptcy, social safety systems structural collapse (increasing risks to humans including possible death--e.g. ValuJet and Challenger), and of course national calamity (e.g. Zaire, Rwanda, the old Soviet Block), and even international disaster (e.g. the Great Depression of the 1930s). So the issue here is how do we embrace and thrive in the rapids of change created in an uncertain complex world system that has collapse as a natural part of life?

Types of Systemic Collapse

Generally, there are two types of systems collapse (akin to the notions of natural and human-made catastrophes). The first is the natural and inevitable bifurcation that follows upon the increasing complexity of a systemic order wherein the order of the system (its outcome basin) collapses and then reforms into a new order.

A system self-organizes around a strange attraction dynamic of parameters outside of which systemic outcomes cannot exceed but inside of which their outcome is chaotic. In policy making, the outcomes basin is the emergent order or consequences of policy implementation in the context of the rules of formulating, making, and implementing. Those rules form the parameters of action and the shape of the outcome emerges within these boundaries. The variance in this process includes naturally mistakes of perception and calculation and resource appropriateness, etc and the net inconsistencies that result can lead to a policy failure. The need to reformulate is the result. Such policy reformulation is framed as a negative by the culture (e.g. when it was suggested that the welfare reform acts of 1997 might have to be "fixed" later, this was seen as a negative). However, this kind of collapse is natural and is best not feared so much as adapted to and around in the way we live our day-to-day lives, organize our enterprises, and manifest our society. It is embracing evolution if you will. As such, it is integral to being alive.

The second type of collapse results of cognitive and behavioral dysfunction (e.g. denial based or egocentric thinking) that leads to dysfunctional policy implementation and therefore a substandard system of effectively dealing with the reality of life and is therefore incapable of resiliency under stress. This second general form of collapse is an epiphenomenon of the complex variables of human interaction that Tuchman (1984) calls folly--policies pursued by successive administrations that are noted by people (who are ignored) at the time as potentially bad policy and that as a result inevitably lead to catastrophe. The act of people observing the potential catastrophe and calling for a change in policy and of subsequently being ignored and often derided (e.g. as pessimists) in the pursuit of that policy with the result being a collapse rooted in the very same critiques offered and ignored is what I refer to here as the Cassandra Complex.

This second form of collapse is "natural" in that it is part of what it means to be human. However, the results may be more readily mediated than the first type of collapse. M.. Scott Peck says in the opening line to his book The Road Less Traveled, "Life is hard;" hardship is natural...but I contend it is harder than it has to be. Paradoxically, it is through embracing chaos rather than avoiding it that this problem is best addressed. In policy making, embracing chaos means assuming human errors in perception and mistakes in process and flaws in outcome are natural and this leads to listening to the Cassandra perspective to catch these forms of folly.

Such forms of folly-collapse, making life harder than it has to be, can occur generally in one of three ways or kinds of collapse. In that this form of collapse is unintended, it might be framed as an accident and in this light, the kinds of collapse can be presented roughly following a schema suggested by Langewiesche (1998) in his explorations of the ValuJet Crash of 1996.

***Collapse dynamics of the first kind*:** This is related to what Langewiesche (1998) calls procedural accidents. These are situations where people as individuals and as policy makers develop an over-attachment to rigid belief systems (e.g. a religious or political or economic dogma) and/or specific outcomes (e.g. the GNP as the only indicator of economic vitality further framed as the only indicator of how well society is doing) regardless of contextual appropriateness. The continued use of inappropriate indicators imply illusory levels of success in the face of societal indicators to the contrary (Cobb et al, 1995). The use of rigid standards here leads to a system unable to anticipate problems nor respond to them in a timely or appropriate manner. Indicators shape behavior; you get what you measure for (Goldratt, 1990). Here, GNP/GDP registers anything that stimulates monetary dynamism as positive whether it is the aftermath of an earthquake or the building of a new theater. But note, it does not distinguish between a source of human uplift and a source of human misery; only of dollars flowing through the economy. Thus, genuine progress of the human potential is stymied (Cobb, et al, 1995).

Collapse dynamics of the second kind: These are those collapses rooted in artificial stabilization of an outdated system which in turn is more deeply embedded in human suspiciousness of and bias against change (i.e."if it ain't broke, don't fix it"). This is similar to what Langewiesche (1998) refers to this as engineered accidents. Rather than replace an out of date system, policy

makers may continue to incrementally tweak a system (e.g. the air traffic control system in the United States, or social security, the American two party electoral system) to make it work until it is overloaded. The resultant cost can be more than if they had simply replaced the system when it needed to be replaced. The potential cost may be measured in human pain rather than merely monetary measures. Rarely are the failures found in pilot programs or in testing. Rather, they are found in practice when the damage can be at its highest. It is possible the Constitution of the United State may be such a system in need of serious reform else risking collapse.

Collapse dynamics of the third kind: Related to what Langewiesche (1998) identifies as a systems accident, this is where a system designed to work in one context is made to address problems for which it was not designed thus leading to a set up for collapse (e.g. using the U.S. military to enforce national drug policy). An extension of this is putting demands upon a system beyond its resources to adequately meet the needs but giving it enough resources for it to continue to operate at a bare survival level or simply demanding it perform regardless of insufficient resources (e.g. many behavioral health care systems that are state funded or health care under for-profit managed care systems that utilize unqualified workers). Examples of potential systems collapse include situations where an overloaded CPS system fails to pick up on a case of abuse and a child dies; a nurses aid inserts the wrong tube in a patient (e.g. feeding tube int the lungs) and a death results; or a soldier on border drug patrol shoots a shepherd unfortunate enough to be in the wrong place.

This system-structural rooted collapse is the most insidious kind of collapse precisely because the conditions that set up the potential collapse are so very seductive! It is because in practice, what can go wrong usually goes right (Langewiesche, 1998) and often for a long period of time. Based upon this "unfortunate-good-luck," many warnings of catastrophe are ignored by ideology driven policy makers in areas such as economic policy (e.g. supply-side economics based tax policies) and environmental policy (e.g. global warming, desertification, etc.), health care (e.g. the inherent malpractice of business concerns distorting ethical clinical standards of care, practice, and judgement), to name just three examples. Further, the people making the warnings are then derided as doomsayers, hysterics, ...Cassandras. And that is the point.

Daniel Quinn (1992) offers a parable of this tendency to ignore all negative feedback evidence that things may be "off" in a "can-do," accentuating the positive manner. He weaves a tale of the man who builds an unlikely flying machine and--ignoring critics who warn of impending doom if he tries to fly that thing--jumps off a cliff of many thousands of feet in altitude. All the while the machine is falling (unable to fly), from the pilot's perspective, he is airborne. In fact, it is only when a few hundred feet above the ground that it dawns upon the pilot that all is not well, and finally when the contraption crashes.... well of course, then we can conclude that those critics at the top were right. But by then the point is moot. As long as the ersatz system works, "everyone is a hero," the taxpayers are pleased, and the critics are perceived as hysterical enemies of progress. But if the system fails, there is hell to pay. And the cost is potentially measured in terms of human misery while the initiators of the original course of policy action are out of office. This dynamic may be played out in states like Arizona and New Jersey where

supply-side tax cutting policies coupled with the necessity to achieve super majorities or voter approval to increase taxes will lead to a systems collapse in the future when there is an economic downturn.

Personal systems (e.g. one's lifestyle), family systems, organizational systems, and national systems can all collapse from dynamics such as these. Collapse can occur from one, two, or three of the above types of collapse dynamics in complex interplay.

Lessons in Civilizational Collapse for Modern Policy Makers

Civilizations collapse from such dynamics in inadequately meeting the demands of transformational cycles. This is the case of both the Ottoman and Chinese Empires between 1300 and 1900 C.E. (Braudel, 1982; Tainter, 1988). If a visitor to planet Earth had looked at the world in 1300 and pondered which civilization would be dominant in 1900, few might have chosen Northwestern Europe. But the empires of the East were incapable of adapting to changing times and the dynamic civilization of Europe and the emergent Capitalist World System was ever adapting and over the next six hundred years sucked the life out of the former great powers. Rigid over attachment to tradition and structural rules destroyed China and Ottoman Turkey. Could they also serve as object lessons to the once dynamic system that supplanted them? That is to say, is the modern system of liberal capitalism–rooted in the assumptions of industrial age perspectives–too "byzantine" to survive in the post Soviet world in the twenty-first century information age knowledge economy? Should we learn from the Turks and the Chinese that it is OK to let go of traditions when they no longer work? The Cassandra perspective suggests that the answer is we have no choice if we wish to thrive in the next century.

The collapse of the socialist eastern European governments in the late 1980s and early 1990s can be viewed as a result of the dynamic interplay of collapse dynamics of all three kinds. The collapse in the Soviet system was brought about in part by its attempt to compete with the United States in an expensive arms race in which the Soviet Economy could no longer compete. But the collapse was not as bad as it could have been due to policies enacted under the leadership of Michael Gorbachev. Had he attempted (and succeeded) in keeping the Soviet system stable any longer, it would have been worse for the people of Eastern Europe. The extent to which the collapse as it occurred is in fact more problematic than it might have been for the people now is the extent to which the system was artificially stabilized too long after it should have collapsed. Either way, times of change are hard. But Gorbachev's policies inviting systems collapse made it better than it could have otherwise been. The degree of misery a people suffer after collapse is a measure of the time beyond a natural bifurcation point the system remained artificially stabilized. The new emergent order or stable state following the phase shift in Eastern Europe was unpredictable from the perspective of the prior stable state. It is still in flux.

The repercussions of these dynamics are still in play for the world system as a whole as well for

there is no such thing as an isolated collapse in interconnected world system (Capra, 1982). Such is the prime methodological perspective offered by the new sciences in policy formation–to be aware of and make concession to this interconnectedness in all policy considerations. Examples of this is the rise of the so called Russian mafia and the instability of Eastern economies as they try to become that to which they were adamantly opposed just a decade ago. Their instability is a threat to the whole world economy today.

For decades, the capitalist west defined itself in the context of the tension with the socialist east. With the collapse of the majority of the so called communist states, some analysts proposed that liberal democracies and capitalist economies were proven to be the best model of ordering society and development from now on would be improvements on this model of social order (Fukuyama, 1992). However, other writers suggest that the collapse could continue globally to include the western systems as well (Shor, 1995). Tainter (1988) notes the possibility of global systemic collapse due to unchecked complexity in the modern world system and continued use of governmental modalities not suited to the end of the twentieth century.

As tension increases, so too does the potential of catastrophic collapse increase as well as the opportunities for creative reorganization. At the event horizon between order and disorder is the opportunity for creativity arising out of creative destruction (Inayatullah, 1994). The old system collapses and the new emerges. If we assume that this is a natural process of living systems, and there is evidence to suggest that this is the case (Kaufman, 1985), then, responsible public policy asks not how to avoid collapse and systemic self-reorganization. Rather, competent and ethical democratic leadership requires of policy makers to enact policy decisions designed to increase the probabilities of the system--and the people in society as the system--to respond adequately to the challenges they face. If the West would like to avoid the traumatic scope of the fate which befell the old Eastern bloc nations, such a shift in world view and policy manifestations rooted in that view is called for.

In the face of such possibilities, responsible policy makers need ask: “are indicators of collapse emerging in our system now?” Only by asking tough questions and courageously looking at real answers can we chart policy courses that may prepare society better. That is the task of responsible democratic leadership. One place to look for answers to this question of potential collapse indicators is in the observations of critics of any given social system, organizational policy, or sources of feedback suggesting not all is well with a given lifestyle or course of action. The particularly good indicator that a piece of critical feedback may be useful might be found in the degree to which it makes us personally uncomfortable when we consider the possibility it might be true–that is, the degree to which it challenges our pet ideological orientation. For the best way to include the Cassandra perspective in the policy making process is to start by asking what if we are wrong and in exploring that perspective honestly, improving policies we would enact. Gorbachev could never have allowed Glasnost and Perestroika to proceed without first entertaining the wild notion that the ideological commitments of the Soviet Union and the class power structure in place for some seven decades might in fact be flawed.

Systems change. This is natural. Yet people fear change and out of this fear, they attempt–often

through government, but just as often in policies and procedures in organizations and other management/administration contexts as well as in their personal lives--to stabilize a system that is too complex to remain stable for long. The result is repeated attempts at applying old solutions to new problems and noting ever increasing pseudo-successes that are exposed as illusions as people experience the dysfunctional consequence of a system that no longer works--exasperating the very problems it seeks to solve (see Maruyama, 1992). Einstein noted that attempting the same solutions and expecting different results is one definition of insanity. Is American society insane? That is the question Cassandra calls upon us to ponder!

The Cassandra Complex and Policy Making

Wendell Bell (1998) argues that "any adequate theory of modern society must include people as active, purposeful, and innovative beings whose future-oriented behavior helps create not only their own future but also the social order itself" (p. 1). At the core of this perspective is the generation of alternative pictures of the futures and making recommendations for being prepared to cope with each scenario that emerges. This is not only to ask what are the best possible futures but also to look courageously at the worst possible or even so called impossible futures. This is inherently a method rooted in the new sciences allowing hard questions to be asked and the generation of creative alternatives in the process of co-creating our future as a society. Glasnost and Perestroika are Cassandra oriented notions of policy making.

Holism and Flexibility

The Cassandra Complex results when, despite evidence to the contrary, policy makers adhere to dogmas that no longer work rather than to the lived experience of people actually living the consequences of their policy decisions. An example may be illustrated wherein the ideology of the capitalist market leads policy makers to dismiss contrary perspectives which suggest that we may wish more control on business in the area of pollution to avoid global warming that scientific research suggests is the result of industrial waste. Rigid principle based policies rooted in absolute or inflexible standards increase the probability of collapse in the outcomes basin of a policy precisely because they are a denial of the way life really unfolds.

Gilligan's (1982) work suggests that policies rooted more in the lived reality of response and care to the requisites of building and maintaining relationships (community) are far more effective in meeting human needs and able to adapt to changes in context (i.e. the natural collapse and reordering process) than rigid linear standards based policies. The further we get away from informing our perspectives by wisdom of life processes, the more likely we are to experience catastrophic collapse. When policy makers privilege optimistic perspectives, for example, while delegitimating and silencing pessimistic perspectives and/or suggestions of fallibility in our ideological commitments, they are denying a life process centered orientation precisely because life is never all positive or ideologically pure. The positive perspective is only

part of the equation and to make decisions with distorted starting parameters is to distort the process to the degree that the preferred alternative future we seek to create may never arise (Bell, 1998).

There is holistic and more reality based value in the process of actively synthesizing the positive and negative aspects of a debate or the optimistic and pessimistic perspectives (this evokes the yin/yang imagery from Chinese philosophy). In making functional policy decisions/recommendations, to only focus upon the positive or optimistic "can-do' perspective is to start off with a highly distorted course setting for eventual policy outcome. That is to say, a distortion at the outset of a course of policy implementation action can lead to an outcome differential away from the targeted goal in geometric proportion to the initial distortion magnified over the course of the policy implementation period.

Inevitably, what is ignored in the initial policy formation stage is what eventually 'sows the seeds" of project failure. That is to say, when a policy fails, it is usually the very input that was ignored in the formulation phase that is what leads to the collapse of a successful outcome basin. An example of how such negative input is ignored in the process of formulating a policy is found in the interaction dynamic wherein if a person says: "I'll Try" this is often framed by so-called "possibility thinkers" as a set up to fail by building into the formulation the notion that: "maybe I can fail." It is argued that one should say "I will!" However, the harsh fact is that any endeavor can fail and not allowing for the possibility is to open one to ignoring important information about what potential areas in which one might just do so. Another version is to ignore and invalidate observations--of what might go wrong--as investing energy in and attending to negative possibilities and thereby creating it; you get what you attend to. However, without at least some awareness of what might go wrong, policy makers and implementors will be less able to recognize the signs of dysfunctional policies in action if they do emerge in the emerging systemic order of events. Being prepared is what the skills of futures thinking give the policy analyst.

Cassandra Guided Principles

Policy making must 1) not assume a linear progression from implementation to success (there are always detours); and 2) not assume everything must be framed positively (negative perspectives help us avoid mistakes as was illustrated by Graham Allison in his exploration of the Kennedy administration's Cuban 'Bay of Pigs" fiasco). Policy making discourse must integrally legitimate space and an active role for the voice of people that have here-to-fore been delegitimated as "alarmists making prophecies doom." Cassandra's have the role of actively seeking the multi-locus-points of potential collapses in policy systems with the understanding that there is great value in thinking through the consequences of alternative policy paths and thereby allowing us to choose those that seem better suited to increasing the possibilities and probabilities of an outcome we prefer over one we wish to avoid.

Of course, this also requires we be very clear on the vision of what parameter values by which

we wish the interactions within our social order to be governed. That is to say, if we wish the social order to be democratic, we need frame all of our policy formulation attempts in the context of and measured by the template of democratic values as the boundaries of our system outside of which no behavior by policy may exceed. If a potential policy recommendation does not fit a community's commitment to democratic values, it is not a viable policy regardless of other values (e.g. efficiency).

First, policy makers need to give up the need for control and certainty in the process and in expected outcomes. We must give up the sole quest for what Lumley (1997) calls fabricative tangible results and embrace the notion of value in the process as every bit as important as outcome.

Second, we must give up the progressive bias that privileges linear positively accentuated outcomes and attitudes. That is, we must acknowledge as part of the policy process that not all movement, change, and outcomes in a systems outcome basin are 1) linear, 2) beneficial to humans (nor to the planet), 3) necessarily emergent as we intended, or 4) manifest in only short term observable consequences. In legitimating all perspectives and voices in the policy making discourse and, in fact, actively valuing the voice of Cassandra in our deliberations, we can make more robust policies from a position of higher preparedness in coping with the rapids of change.

Third, we must recognize that there is an upper limit to the degree of complexification any system can attain and that all things collapse and that this is a natural and welcome dynamic in the evolution of the social order. Therefore, in our policy making processes, we must consult critics–especially the ones who challenge our pet ideologies–and the lived experience of people–especially when that experience disputes our perceptions of policy success–and be prepared actively abandon even our most cherished social ordering parameters.

The experience of Gorbachev's policies of Perestroika and Glasnost at the national and international level suggests there may be no justification in arguing that grande social policy is unrealistic (e.g. reshaping a whole nation by design). Perestroika could be the ultimate refutation of incrementalism as the only viable form of social reform.

The Inadequacy of Current Attempts at Systems Reform

Drucker (1995) suggests that many proposed schemes of reinventing government are more illusory than real. That the illusions leave many problems fundamentally in place and open the door to even more instability in the future. All too often, changes in government are just reformulations of a root paradigm based in linear and mechanistic foundations. Capra (1982) suggests that much of how government formulates policy today is rooted in antiquated notions of how the world works rooted in a paradigm of reality suggested by Descartes and Newton in the seventeenth century. This world view, as we have discussed, suggests a world that is linear, predictable, and mechanistic like the workings of a clock.

People in this view are objectified as parts of a machine. Constrained by such a paradigm, suggestions for "new" innovations are often posited which in fact are merely reformulations of the old paradigm. Such suggestion are mere tinkering with the machine to make it work better and more in line with hoped for "predictable" outcomes. An example of this approach to governmental change is the notion of incremental and gradual change (see Lindblom, 1959) that never seeks to change government so much as to continually tweak it to respond better while never challenging fundamental assumptions.

Ingraham et al (1994) note that reinvention of government schemes from the public choice perspective discuss fixing the machine and improving on governance, this often entails borrowing from the world of business or the market. It is not a paradigm shift to take components from another discursive structure (e.g. the market or the discourse of capitalism) and transpose these on the canvas of governance. Just as when an artist paints over old paintings, to save on costs of new canvas (cost savings being a common drive of reinvention schema), a pentimento of the old starts to show through the "new" image. The pentimento of linear mechanistic thinking shows through public choice attempts at governmental reinvention because the fundamental assumptions are never questioned and, therefore, begin to distort any real change in favor of previous assumptions.

This is a non-reflective approach to government that never asks is the system we are improving a system that ought to be in place? Does it meet the needs of genuine progress? Does it meet the requisites of addressing challenges of an ever increasingly complex world?

A profound variation of the problem of non-reflective social science is found in the suggestions of public choice theorists when they perceive citizens as consumers and suggest market mechanisms for reformation of government. The market is very powerful in delivering cost effectiveness and responsiveness to government services delivery. However, the market is not always congruent with democratic vision. Peters (in Ingraham et al, 1994) notes that applying such innovations to governance without ensuring the visions of democratic governance as the context within which reform efforts are enacted will result in problematic results at best. The question for good governance in the context of democratic vision and market innovations is: are the requisites of democracy or of capitalism supreme? Braudel (1982) notes that capitalism is primarily a system of hierarchical dominance that favors the centers of power. This is not congruent with democratic imperatives of equality, liberty, and order driven by the demands of the public good. The market suggests that what is profitable and what people are willing to pay for is what is good. This is not in line with the vision of Jefferson and Lincoln when they talk of life, liberty, and the pursuit of happiness and the notion that government is devoted to the proposition that all people are equal.

In a democracy, citizens can never be customers. Government of, by, and for the people in the context of democracy is more than the mere interests of a monied class or what people are willing to buy. A government reformulated in terms of a market discursive structure is more likely to be a plutocracy than a democracy. The requisites of democracy are hard and customers rarely make hard choices far preferring short term gain for minimal cost. So what would public

administration and governance look like if it were approaching its endeavors from a really new paradigm?

Adequate Alternatives for Systems Reformation

For discussion, explored here are some initial sketchy thoughts regarding adequate policy making. Complexity or advanced systems theory offers a real alternative. For example, Senge (1990), Ingraham, et al (1994), and Lumley (1997) explore the notion of the learning organization. A self-organizing adaptive systems approach to organizational theory that can be applied to governance as well as business. At the base of the systems approach to governmental change is a shift from control oriented government to facilitative governance and a recognition that systems are fundamentally about relationships (e.g. between people) exposing the primal interconnectedness of reality (see Capra, 1982).

Governance utilizing these notions frames society as a system that experiences flux and transformations in behavior patterns that defy effective prediction. The job of public administration and government from this perspective of governance, in a democratic society so conceived, is to ensure and the vitality and integrity of democratic vision and to facilitate the opening of space for democratic action (e.g. citizen participation). The higher the level of governance, the more it is involved in the enterprise of guaranteeing and empowering the democratic vision. The lower the level of government is the more the focus would be on the partnership between public, private, and social sectors in manifesting democratic community.

Democratic vision acts as a strange attractor around which a self organizing order of participatory democratic community forms and emerges.[2] If in this context market ideas can be helpful, then they are appropriate. Policy which empowers people in participation in their own governance would be appropriate (see Ingraham et al, 1994). Although discussed as ideal in earlier democratic discourse, participation was not emphasized in lieu of the demands of a market framed in terms of hierarchy and zero-sum competition. Participation here is facilitated action that seeks win-win scenarios and choices which continue play--thus: the infinite game (Carse, 1986).

The role of policy making and implementation in this process starts with an empowered professionalization of the people who play decisive roles in governance; Lipsky's (1980) "street level bureaucrats" (the people who actually deliver services and implement policy). Rather than unambiguous control centered rules, the guides to democratic policy implementation are the principles of democracy, ethics, and local reality. As suggested by Gilligan (1982), response and care to the real lived problems of people here and now is a more appropriate guide to effective policy than rigid adherence to abstract notions of bureaucratic rules and control mechanisms.

2 See Wheatley, (1992) regarding this perspective of the order inducing role vision and visionary leadership plays in systems.

By Way of Conclusion

Carse's (1986) discussion of the notion of finite and infinite games turns us to the metaphor of a game. Infinite games are played to win and infinite games are played to continue play. This echoes Gilligan's (1982) notions of an ethic of care and response continuity in morality versus an ethic of finite ends more usual in Western society today. The notion of continuity and survival in an ever increasing complex world should replace competitive and win-lose policy choices that may be an invitation to catastrophic societal collapse.

A compassionate public policy ought seek to address this concern by simultaneously seeking to avert catastrophic collapse and to prepare society to engage in the manifestation of a new order to arise out of the turbulence. Many authors have written about such a public policy and the social science guiding it as being based in the emergent understandings coming out of the new physical sciences (Daneke, 1990; Faber & Koppelaar, 1994; Gregerson & Sailer, 1993; Loye & Eisler, 1987; Treadwell, 1995). Public policy needs be aimed at creating a compassionate democracy flexible enough to meet the needs of increasingly complex society in the twenty-first century. This is the task of leadership empowering governance.

Falk (1987) makes the distinction between government and governance in discussing the character of social order in meeting the challenges of the next century. Government is more of a structured solution focused finite concept. Governance has more to do with the emergent order arising out of the dynamic activities of empowered social movements of people governing themselves. The work of Senge (1990) and Wheatley (1992) suggests that the task of leadership and policy makers is to facilitate democratic vision among and empowerment of people such that they can govern themselves in a real participatory democracy that enhances the notion of continual learning and adaptation. People are empowered in such a fashion such that through their associations in organizations and movements they engage in self governance in transforming society to meet the realities of the next century (Brown, 1991; Drucker, 1994; Falk, 1987; Henderson, 1993).

What has been discussed here has been the call to reshape our perspectives and approaches to government and public administration such that we might better be able to embrace chaotic changes and adapt to sudden shifts which are more a reality now than ever in the past. Traditional approaches to problem resolution lead us only deeper into the probability of catastrophic systemic collapse. Democratic public policy requires we acknowledge this possibility of catastrophe and legitimate the role of Cassandra–the perspective of the potentiality of dark scenarios and the certainty of uncertainty--and seek more adaptive mechanisms rooted in the notions of complexity, self-organizing systems, emergent order, and decentralized and impermanent control to prepare society better for flexibility, uncertainty, and flux that is the reality of the twenty-first century. In this fashion we are better able to empower people in their multiple roles–including that of policy maker–to co-create preferred alternative futures.

***

References

Adams, S. (1997). *The Dilbert Future*, New York, Harper.

Allen, P. (1994). Coherence, chaos, and evolution in the social context, *Futures*, 26(6), 583-597.

Aristotle (1971). *On man in the universe*, Louis Loomis (ed)., Roslyn, NY, Walter J. Black.

Baker, P. (1993). Chaos, order, and sociological theory, *Sociological Inquiry*, 63(2), 123-149.

Bell, W. (1998). Making people responsible: The possible, the probable, and the preferable, unpublished manuscript (tentatively accepted for publication in a forthcoming issue of the *American Behavioral Scientist*).

Berlin, I. (1991). Two concepts of liberty, in *Liberty*, David Miller, ed., New York, Oxford.

Boxer, P. and Kenney, V. (1990). The economy of discourses: A third order cybernetics?, *Human Systems Management*, 9(4), 205-224.

Braudel, F. (1984). *The perspective of the world: Civilization & capitalism 15th-18th century*, New York, Harper & Row.

Brown, L. (1991). Bridging organizations and sustainable development, *Human Relations*, 44(8), 807-831.

Capra, F. (1982). *The turning point: Science, society, and the rising culture*, New York, Bantam.

Carse, J. (1986). *Finite and infinite games: A vision of life as play and possibility*, New York, Ballantine.

Cobb, C., Halstead, T., and Rowe, J. (1995, October). If the GDP is up, why is America down?, *The Atlantic Monthly*, 59-78.

Daneke, G. (1990). A science of public administration?, *Public Administration Review*, 50(3), 383-392.

Drucker, P. (1995, February). Really reinventing government, *The Atlantic Monthly*, 49-61.

Drucker, P. (1994, November). The age of social transformation, *The Atlantic Monthly*, 53-80.

Faber, J. and Koppelaar, H. (1994). Chaos theory and social science: A methodological analysis, *Quality and Quantity*, 28(4), 421-433.

Falk, R. (1987, April), The global promise of social movements: Explorations at the edge of time, *Alternatives*, 12, 173-196.

Frank, R. and Cook, P. (1995). *The winner-take-all society*, New York, Free Press.

Fukuyama, F. (1992). *The end of history and the last man*, New York, Avon.

Funtowicz, S. and Ravetz, J. (1994). Emergent complex systems, *Futures*, 26(6), 568-582.

Gilligan, C. (1982). *In a different voice: Psychological theory and women's development*, Cambridge, Harvard University.

Gleick, J. (1988). *Chaos: The making of a new science*, New York, Penguin.

Goldratt, E. (1990). *What is this thing called theory of constraints and how should it be implemented?*, Croton-on-Hudson, NY, North River Press.

Goldstein, J. (1988). A far-from-equilibrium systems approach to resistance to change, *Organizational Dynamics*, 17(2), 16-26.

Gregerson, H. and Sailer, L. (1993). Chaos theory and its implications for social science research, *Human Relations*, 46(7), 777-802.

Henderson, H. (1993). Social innovation and citizen movements, *Futures*, 25(3), 322-338.
Herbert, W. (1995, March 6). Our identity crisis: In angry times, can we rebuild a true American sense of community?, *U.S. News & World Reports*, pp. 81-87.

Inayatullah, S. (1994). Life, the universe, and emergence, *Futures*, 26(6), 683-696.

Ingraham, P, Romzek, B., & Associates (1994). *New paradigms for government:Issues for the changing public service*, San Francisco, Jossey-Bass.

Johnson, R. (1998, January 11). Collapse exposes global miracle, *The Arizona Republic*, p. H5.

Kaufman, H. (1985). *Time, chance, and organizations: Natural selection in a perilous environment*, Chatham, Chatham House.

Langewiesche, W. (1998, March). The lessons of ValuJet 592 , *The Atlantic Monthly*, 81-98.

Lindblom, C. (1959). The science of muddling through, *Public Administration Review*, 19(1), 79-88.

Lipsky, M. (1980). *Street-level bureaucracy: Dilemmas of the individual in public services*.

New York, Basic Books.

Loye, D. and Eisler, R. (1987). Chaos and transformation: Implications of nonequalibrium theory for social science and society, *Behavioral Science*, 32(1), 53-65.

Lumley, T. (1997). Complexity and the "learning organization: Addressing team performance in new science terms," *Complexity*, 2(5), 14-22.

Manning, R. (1998, January 11). Disaster's fallout starts to add up, The Arizona Republic, p. H5.

Maruyama, M., (1992). Dysfunctional, misfunctional, and toxifunctional aspects of cultures, organizations, and individuals, *Technological Forecasting and Social Change*, 42, 301-307.

O'Connor, M. (1994). Complexity and coevolution: Methodology for a positive treatment of indeterminacy, *Futures*, 26(6), 610-615.

Osborne, D. and Gaebler, T. (1993). *Reinventing government: How the entrepreneurial spirit is transforming the public sector*, New York, NY, Plume.

Petroski, H. (1994, May). The merits of colossal failure, *Discover*, p. 75-81.

Putnam, R. (1993). What makes democracy work?: Importance of a vital civic life, *National Civic Review*, 82(2), 101-107.

Quinn, D. (1992). *Ishmael*, New York, Bantam.

Schon, D.A. (1987). *Educating the reflective practitioner*, Jossey-Bass, San Francisco.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization*, New York, Doubleday.

Shore, B. (1995). *Revolution of the heart*, New York, Riverhead.

Stillman, R. (1991). *Preface to public administration: A search for themes and directions*, New York, NY, St. Martin's.

Tainter, J. (1988). *The collapse of complex societies*, Cambridge, UK, Cambridge University.

Thomas, A. (1995, March 28). Self-centeredness threatens our society, *The Arizona Republic*, p. B5.

Treadwell, W. (1995). Fuzzy set theory movement in the social sciences, *Public Administration Review*, 55(1), 91-98.

Tuchman, B. (1984). *The March of Folly: From Troy to Viet Nam*, New York, Ballantine.

Wheatley, M. (1992). *Leadership and the new science: Learning about organization from an orderly universe*, San Francisco, Barrett-Kohler.

Whitman, D. (1997, December 29). On not believing the good news, *U.S. News & World Reports*, p. 44-46.

Young, T. (1992). Chaos theory and human agency: Humanist sociology in a postmodern era, *Humanity & Society*, 16(4), 441-460.

Young, T. (1991a). Chaos and social change: Metaphysics of the postmodern, *The Social Science Journal*, 28(3), 289-305.

Young, T. (1991b). Chaos Theory and symbolic interaction theory: Poetics for the postmodern sociologist, *Symbolic Interaction*, 14(3), 321-334.

Zolo, D. (1992). *Democracy and complexity: A realist approach*, Cambridge, Polity.

***