

Technological Elaboration, Societal Dysregulation & Societal Regression

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Overview of Presentation

- Basic Premises of Today's Presentation
- Terms used in today's presentation
- Background: influences on today's thinking
- May 2011 conversations with Eva Sternberg in Göteborg, Sweden about biological underpinnings of human functioning
- Early thinking about adaptation, technology, threat & response to threat in 1995 & 1997 articles In *Family Systems*, “Natural Selection, Technology and Anxiety” (2:2, 138-156), & “Naturally Constrained Social Systems” (4:1, 19-33)
- Examples of technological conditioning of the physical environment
- Under what conditions might technological elaboration contribute to societal regression?
- What might it take to interrupt that regression?

Basic Premises of Today's Presentation

- Technological conditioning of the environment is not unique to the human.
- Technological conditioning can operate at the instinctual level in the human species.
- Instinctive conditioning of the environment through technological elaboration of relatively permanent artifacts has the potential to fundamentally influence cultural aspects of biological conditioning of the environment.
- Under some conditions cultural regulation of technological conditioning may prove insufficient.
- Under such circumstances, cultural efforts to strike an appropriate balance between individual & group health may fail, in which case regression would be the outcome.

Terms used in today's presentation-1

- Instinctual: Automatic :
 - Bowen theory- “a theory about the functioning of the emotional system in man. In broad terms, the *emotional system* is conceived to be the function of the life forces inherited from his phylogenetic past, that he shares with the lower forms, and that governs the subhuman part of man. It would be synonymous with instinct, if instinct is considered to be the forces that operate automatically.” (Bowen 1978, 423)

Terms used in today's presentation-2

- Technology: from the Greek *-systematic treatment*; encompasses *applied science*, which in turn encompasses *knowledge acquired by study and practice, including knowledge about the physical world*.
- Note: This is an anthropocentric definition. It begs the question of whether species other than the human can systematically acquire knowledge of the physical world in which they live & apply that knowledge to conditioning of that world to ameliorate the conditions of life that they are encountering.
- Without prejudging how such knowledge might be acquired, applied or transmitted, the assumption is that technological conditioning of the environment is not unique to the human species.

Terms used in today's presentation-3

- Culture: *transfer of information by behavioral means [accumulating] in the form of knowledge and tradition* (Bonner 1980, 10; definition used in '95 article).
- Note: Irrespective of wording, “culture” is not unique to the human as Bonner 1980, “The Evolution of Culture in Animals,” makes clear.

Terms used in today's presentation-4

- Regulation: dynamical feedback process between & within a system & its subsystems in order to maintain appropriate within-system behavior, communication & functioning & ensure proper functioning of the overall system.
- Note: System-level regulation inherently constrains autonomy of subsystems to regulate themselves; hence, system-level regulation inherently & dynamically balances needs of the system & needs of its subsystems. However, mutual influencing of functioning occurs between/among system & subsystems, but there is automatic biasing in favor of controlling system's needs.
- Note: Regulation can occur simultaneously at multiple levels of the regulated organism.

Terms used in today's presentation-5

- Dysregulation: failure to appropriately regulate within-system behavior & functioning, thereby compromising or having potential to compromise overall system behavior & functioning.
- Recommended reading for an understanding of dysregulation: Siddhartha Mukherjee's 2010 book, *The Emperor of All Maladies—a Biography of Cancer* (New York: Scribner).

Background: Influences on today's thinking

- Experience with Bowen theory since 1980 that has led to my working towards a *beginning* theory of society as an emotional system: work systems (1980s & 1990s); societal seminar (early 2000s); societal conference (2007-2009); post-conference (2009-present)
- Conversations with Eva Sternberg, May 2011, Goteborg Sweden on biological underpinnings of human functioning
- Reflections on my 1995 & 1997 articles—early efforts to understand human societies as part of all life on Earth & sharing commonalities with other societies
- Regulation of civilian uses of nuclear energy through cultural means, including standards setting, rulemaking, legislation, etc. (1975-present)
- Experience in the conduct of multi-party negotiations in a consensus environment
- Cancer as dysregulation at a deep biological level (2007-present). But note: Mukherjee notes that the chaos of cancer operates by rules that are still being discovered.
- *Chimeras and Consciousness: Evolution of the Sensory Self* (2011)
 - Studies in the regulation of the relationships creating and sustaining the process of life.

May 2011 conversations with Eva Sternberg

Göteborg, Sweden-1

- Regarding biological underpinnings of human functioning:
 - Humans: terrestrial, territorial, highly social mammals, mortal
 - Human young have prolonged period of dependency on others for survival, security & well being, during which basic level of functioning is developed & reinforced.
 - Human social systems are regulated systems. Regulation balances instinctive forces promoting individual survival, security & well being, & instinctive forces promoting group survival, etc.
 - Religion is one mechanism facilitating within group regulation of relationships in the direction of greater cooperation, collaboration, etc., David Sloan Wilson believes religion is adaptive at level of the group (see *Darwin's Cathedral*).
 - In social animals, regulation is biased toward group survival, security & well being as survival of all members is not necessary for group survival.

May 2011 conversations with Eva Sternberg

Göteborg, Sweden-2

- At least during period of dependency, individual survival, security & well being depend on group survival, etc., in significant measure, if not wholly.
- The family is the basic societal unit of functioning & social organization & regulator of individual functioning.
- Assuming that the family functions as a fundamental resource, 3-generation families should be more robust than 2-generation families.
- Communities (aggregations of inter-dependent families) should be more robust than one multi-generational family with respect to managing complexity. Communities can accomplish what families working alone cannot accomplish.
- Post-Script: Like other animals, humans automatically & dynamically elaborate their environments technologically & culturally in the process of adaptation.

Reflections on the 1995 paper-1

- Calhoun on relationships between population dynamics & social behavior:

“Wherever animals live they are constantly altering the environment about them ... [i.e.] biologically conditioning the environment... [which] has repeatedly been shown to alter the welfare of existing members of a population as well as the density exhibited by later generations.

“[S]ociality is a factor in affecting the welfare of the group. There is a tendency among many animals toward group activity, the result of which ameliorates the environment so that their physiology is more efficient or that survival rate is increased... Beyond a certain point the same activity may become deleterious as the participating group increases in numbers, to the point that the formerly beneficial activity lowers survival rate or physiological efficiency. The merits of any social behavior are thus relative to the conditions and history of the group within which they occur.” (Calhoun 1952, 142-143).

Reflections on the 1995 paper-2

- Calhoun on cultural aspect of biological conditioning:

As soon as animals begin to condition their environment through the elaboration of relatively permanent artifacts, such as trails, nests, burrows, and the like, biological conditioning assumes a more definite cultural aspect....[B]eyond such primary functions, [artifacts] ... further serve as a physical mold in which the social matrix takes its form. (Calhoun 1952, 143).

- Dunbar on an animal's biological system's including:

- *Not just its physiological machinery, but also those aspects of its ecology on which survival depends and the other individuals with whom it interacts. Everything an animal does, it does within an ecological and a demographic context, and that will have important implications for many other aspects of its behavior. We cannot, in other words, study particular kinds of behavior in isolation because if we do we may not be aware of the limitations and costs imposed on an animal's freedom of movement by other features of the biological system within which it has to operate (Dunbar 1988, 5).*

Reflections on the 1995 paper-3

- Recapping what Calhoun, Bonner & have to say:
 - Conditioning physical environments through relatively permanent artifacts such as nests, burrows, dens, trails, etc., automatically and dynamically create physical molds that shape the societal structure and functioning of their creators.
 - Understanding environmental context is essential to understanding conditioning.
- An inference to be drawn is that technological conditioning of physical environments shapes social functioning within those environments such that biological conditioning takes on a cultural aspect.
- We live in dynamical systems of dynamical interdependencies in which initializing conditions are constantly changing. [inspired by Valdeane Brown's discussion (10 Sept 2011) of the dynamical functioning of neurofeedback systems. Influenced by Bowen theory, Brown developed the Neuroptimal neurofeedback technology.]
- Technology is grounded in applied science, including knowledge of the physical world. As knowledge of the physical world increases, the capacity for technological elaboration expands, as does capacity for technologically-based shaping of societal structure & functioning & further conditioning of the physical environment.
- The foregoing framework is species-independent. However, context must never be overlooked.

Reflections about “Naturally Constrained Social Systems”

- Calhoun also influenced my 1997 paper , “Naturally Constrained Social Systems.” He wrote:

“Whenever the density of a population becomes increased beyond that which the heredity-to-environment relationship provides optimum adjustment, then the individual and the group must forfeit some of their potentiality of behavior if all members are to maintain an adequate state of health.” (Calhoun 1952, 140)
- Questions:
 - What happens when a population can no longer maintain “optimum adjustment” through the “heredity-to-environment relationship”?
 - Can cumulative effects of technological elaboration bring about anthropogenic changes in biological conditioning of the environment that outstrip the capacity of the cultural aspects of conditioning to regulate technological elaboration?
 - Can cultural aspects of biological conditioning interrupt regression?

Conditioning the Physical Environment Technologically

- The next set of visuals provides examples of technological conditioning of the physical environment through the elaboration of relatively permanent artifacts.
- Query: What can one infer from the examples about how those elaborations might have changed the cultural aspects of the biological conditioning of the environment & might have contributed to molding societal structure & functioning?

Beavers –Animal Engineers *par excellence* *Castorian Conditioning*



Beaver as Animal Engineer *par excellence*

- <http://en.wikipedia.org/wiki/Beaver>
- “The beaver (genus *Castor*) is a primarily nocturnal, large, semi-aquatic rodent. *Castor* includes two extant species, North American Beaver (*Castor canadensis*) (native to North America) and Eurasian Beaver (*Castor fiber*) (Eurasia). Beavers are known for building dams, canals, and lodges (homes). . . . Their colonies create one or more dams to provide still, deep water to protect against predators, and to float food and building material.” (printed from Beaver wiki, 8 Oct 2011)
- Note: the beaver lives in a dynamical physical environment constantly being changed through beaver engineering. The beaver knows what’s good for beaver society by way of resources & the use & shaping of those resources. Ultimately, the beaver must move on to colonize new water-based ecosystems, leaving behind an altered environment for reuse & colonization by other species.

Pittsburgh, Pennsylvania



Pittsburgh, Pennsylvania



Vienna Maryland: Electricity transmission towers crossing the Nanticoke River



Scotland—Fishing Trawler



Sao Miguel, Azores—Agricultural Terraces



Sweden: Conditioner-in-Training



Further reflections on the 1995 paper-4

- To understand the behaviors of a natural system at any point in time, it is necessary to understand the conditions under which the behaviors are unfolding AND the history of the system in which the behaviors have occurred.
- With respect to today's talk, to understand the behavioral changes Bowen observed over time that provided the basis for the societal concept & gave rise to the regression hypothesis, one must look at historical conditions that might have shaped the cultural changes & how technological conditioning might have shaped those changes.
- Question: What contributions might technological conditioning have made to the duration & intensity of the current regression?

Under what conditions might technological elaboration contribute to societal regression?-1

- Technological innovation has had a major impact on conditions of life we experience today. How might technological innovation have contributed to the duration of the current global regression?
- To examine this question within the framework of Bowen theory, it is important to examine the biological substrates of the regression.
- According to the theory, chronic sustained anxiety fuels regression.
- So, during periods of chronic sustained anxiety, functioning, including technological elaboration, would be expected to be more instinctual, & automatic, as would cultural responses influenced by the technological elaboration. For example, after repeated floods that inundate cities or towns or valuable lands, levees are often constructed to hold back floodwaters up to a certain level. Laws or ordinances may be put in place to limit use of the floodplain or establish conditions for use. However, often levees are used to straighten riverine beds, which heighten flow velocities that may have other adverse consequences.

Under what conditions might technological elaboration contribute to societal regression?-2

- When a regression is already underway, a society would already be experiencing chronic, sustained anxiety, which biases functioning in the direction of instinctive, automatic reaction; e.g., during wartime or during periods of terrorism.
- Technological conditioning in response to real or imagined biological level threats to a society's survival, security or well being could be expected to have an instinctual, automatic component; particularly, when immediate responses are needed to forestall calamity.

Under what conditions might technological elaboration contribute to societal regression?-3

- Technological elaboration to solve near-term problems without regard to long-term consequences. Sometimes, the science is not available to understand the consequences or risks. Sometimes the science is ignored.
 - Saline seeps in Australia & North America in once prime agricultural lands; water-logging, leaching of nutrients, water table rise, & water wastage in Egypt, India, Pakistan, former Soviet Union, as well as Australia & the U.S. (Hillel 1991)
 - Sediment dumping from hydraulic mining; debris flows & landslips on reclaimed coastal areas or steep slopes; ground subsidence, sinkholes; coastal erosion, etc. (Goudie 1990);
 - Genetically modified crops that enable farmers to spray herbicides on their fields without hurting corn or soybeans, but destroying “weeds” that support pollinators that have co-evolved together (*The Washington Post*, 9 Oct 2011, A1, A10);

Under what conditions might technological elaboration contribute to societal regression?-4

- Technological elaboration to solve near-term problems without regard to long-term consequences (continued):
 - Dust Bowl in American & Canadian prairies (1930-36/40) had both climatic & anthropogenic origins, but the human component, which resulted from poor agricultural practices during the preceding wet period, when the land was first disrupted, greatly exacerbated the erosion from the drought & winds & triggered mass migrations from the prairies & abandonment of farms.
 - The abandonments facilitated aggregation of farmlands into larger holdings suitable for industrial-scale agricultural practices that emerged in the post-WWII economy, the backbone of which were pesticides, herbicides & fertilizers that had been developed largely for wartime applications. During this period, emphasis was on creating civilian economies, ensuring employment & producing consumer goods.

Under what conditions might technological elaboration contribute to societal regression?-5

- Technological elaboration to solve near-term problems without regard to long-term consequences (continued):
 - The Manhattan Project provides another example of an exigent wartime effort to achieve the technological breakthroughs as quickly as practicable needed to win the war . The focus was on near-term breakthroughs, with deferred attention to possible unintended consequences. The Atoms for Peace Program reflects a desire to apply outcomes to civilian applications. Both technological & cultural elaboration was used to regulate the peaceful uses of atomic energy.

Under what conditions might technological elaboration contribute to societal regression?-6

- Technological applications that go beyond the underlying science & underestimate the environmental uncertainties or externalize certain of the costs attending their application; e.g.,
 - Bhopal (1984), Chernobyl (1986), Deepwater Horizon (2010), Fukushima (2011)
 - These examples illustrate how technological elaboration can escape societal regulation through cultural conditioning as shaped by the technological application.
 - Industrial agricultural applications, including the use of Confined Animal Feeding Operations (CAFOs) provide another example of technological elaboration that has escaped adequate societal regulation. Continuing externalization of costs to land, water & society provides evidence of escape.
 - The global collapse of the financial & mortgage markets also provide evidence of escape.

Under what conditions might technological elaboration contribute to societal regression?-7

- As Calhoun made clear, technological elaboration reshapes the human's relationship with its environment. Further, from consideration of changes in the cultural aspects of biological conditioning, it becomes possible to gather evidence about how the human-environment relationship has shifted.
- Bowen assembled evidence of a cultural shift in functioning as the basis for the 8th concept of Bowen theory regarding emotional process in society.
- Bowen did not assemble evidence to support the societal regression hypothesis. He left that task to others.

Under what conditions might technological elaboration contribute to societal regression?-8

- The United States built a wartime economy in order to prevail in WWII, which included rationing of consumer goods & large scale employment of women to assist the war effort. With the end of WWII, the task was to bring about an orderly transition to a peacetime economy that reintegrated returning members of the armed forces into a civilian society, served the needs of a peacetime society & transformed technological elaboration in the service of war to technological elaboration in the service of peace.
- The shifts in technological elaboration created, *inter alia*, a period of super-abundance, improved health care & population growth, as well as a “cold war” arms race & the specter of atomic war.
- In other words, the end of WWII did not bring about the end of chronic, sustained anxiety. The nature of the threats might have changed, but chronic, sustained anxiety remained.

Under what conditions might technological elaboration contribute to societal regression?-9

- If that assessment is correct, then theory would predict that societal emotional functioning remained compromised. The evidence Bowen assembled to support the societal concept is consistent with this assessment.
- Returning to Calhoun, one may then assume that the ongoing technological elaboration affected the cultural aspects of biological conditioning of the environment.
- Chronic, sustained anxiety distorts judgment. One distortion might have been related to the super-abundance & an automatic, instinctual expectation that it would stretch on “forever.” If that assessment has merit, relaxation of culturally imposed constraints on functioning might have been an outcome.

Under what conditions might technological elaboration contribute to societal regression?-10

- In other words, might not the seemingly endless abundance that followed WWII triggered relaxation of societal constraints on functioning that reset the individuality-togetherness balance in the direction of reduced regulation of the “marketplace”?
- An implicit assumption would be that the marketplace would look out for society’s interests automatically when it took care of individual interests.
- This would be contrary to Calhoun’s observation that under conditions of increased population density, both individual & group interests must be constrained in order to ensure adequate health of the individual & the society.
- If this observation has merit, might it not be that the dysregulation being experienced today had its genesis during the euphoric, but anxiety-driven cultural elaboration taking place in the post-WWII era of super-abundance?

What might it take to interrupt that regression?-1

- Did dysregulation of society begin in the shift from wartime scarcity to the seemingly infinite abundance of the post-WWII emergence of a consumerist society?
- An inference to be drawn from this presentation is that the roots of dysregulation might be found in the technological elaboration represented by the shift from wartime to peacetime economy.
- A characteristic of technological elaboration is its relatively permanent conditioning of the environment. A longitudinal view of technological elaboration reveals that its effects are cumulative absent a natural catastrophe that alters the effects more or less permanently.
- So a roll-back of technological elaboration may prove impracticable of achievement, particularly on a large scale.

What might it take to interrupt that regression?-2

- This raises the question of whether societal dysregulation can be interrupted or turned around through cultural elaboration alone, particularly on a large scale, especially given that cultural elaboration follows technological elaboration AND technological elaboration has been a primary engine of changing the human's relationship with the rest of life on Earth.
- Katharine Baker's presentation, "The Locavore Movement as a Response to Societal Anxiety," addresses the question of interruption of regression through community-based action, grounded in principle & science.
- The locavore movement is a form of technological elaboration that offers the potential for cumulative effects in the direction of improving the human's relationship with its environment, both locally & more broadly if its adoption spreads.

Wrap-Up

- Adaptation by technological elaboration to conditions of life, especially those affecting survival, security or well being at the group level is not uniquely human.
- Cultural regulation of societies for purposes of organizing & regulating living in groups in technologically-altered environments is not uniquely human.
- Instinct (automaticity) plays a role in technological elaboration , at least in some cases. ALMOST ASSUREDLY UNDER CONDITIONS OF SUSTAINED THREATS TO SURVIVAL, SECURITY OR WELL BEING & CHRONIC, SUSTAINED ANXIETY, automaticity will be a factor.
- When automaticity is implicated, challenges to a society arise with respect to regulating its relationship with the environment.
- The presentation briefly touches on the question of cultural elaboration & interruption of societal regression. Katherine Baker's presentation is referenced.

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