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Editor's Note- In Memory of Alan Fricker

It is with great sadness that we report Alan Fricker's death of a heart attack September 11 while cycling home.

Alan was a catalyst of futures studies in New Zealand, helping organize numerous workshops on sustainable futures, the alternative APEC and other social forums. He was a scientist working to transform the nature of science and the future of the future. Always reflective, he prodded us on to think deeper on the future through his questioning and indeed his silence.

Alan contributed a number of fine articles to the Journal on a range of issues including biomimetics, factors underpinning genetic engineering and money and sustainability. His last piece was a lovely poem titled, "Tomorrow's Modern Futurist."

We honor him with a poem as well written by Joe Bell.

In Conversation

A caring community needs catalysts

- a master of the pregnant pause and measured tone the trouser hitch and handkerchief - Alan got us talking to each other about the present and the possibilities he stirred us up and inspired with words like 'construct', 'paradox' and 'paradigm'.

Who, who saw and heard, could ever forget the Rowan Atkinson monologue the place in the choir or his shared poems and the wisdom of futures best seen by taking a step back, the inspiration of thought on affordable housing, biomimicry and not creating the waste in the first place. Treading the fine line edge between order and chaos where interests and involvements twitch senses of social justice, understanding and nature; a sunset splashed across the Bay a view from the hill; flight and call of oyster catcher tui, bellbird, kereru and fancy.

We are all enriched by the potpourri experience and a guiding light has shown us the way - it is up to us to honour the memories.

Joe Bell " gbaybell@xtra.co.nz

In memory of Alan Fricker, inspirational sage.

A Transformational Pedagogy for Futures Studies with a Case Study in Biodiversity Futures

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Abstract

A pedagogy was developed for a college-level class in futures studies. The pedagogy includes lectures and exercises in nine different tools. The sequence of tools begins with providing familiarity with futures studies and issues of societal transformation and ends with developing an understanding of the link between individual responsibility and the evolution of a conscious society. The tools are then applied to a variety of thematic areas, one of which, biodiversity futures, is covered in depth in this paper.

Introduction

This paper draws from activities and experiences in a one-semester course on futures studies taught at Florida State University. The course is taught within the Department of Geography and Environmental Studies and is open both to seniors and to graduate students. During the first half of the semester, the "inter-discipline" of futures studies is introduced, and nine specific tools are covered. Each tool is covered in a one-hour lecture, and various individual and group homework assignments are geared to the implementation of specific tools. During the second half of the semester, pedagogy shifts from lecture to seminar, and various thematic topics are covered, including potential futures of energy, the environment, education, patriarchy and gender, youth, dissidence, and war and peace. The nine tools are applied to each of the specific themes and are an integral part of the term papers that students write on a futures topic of their choice. This paper reviews the nine tools

and then covers the application of the tools to a single topic – biodiversity futures.

The Tools

The nine tools include a mix of techniques drawn directly from the futures studies literature, models drawn from sociology, psychology, and religion, and methods that were developed by the author. The progression through the tools begins with techniques that are easy to apply and that are useful in organizing a variety of facts, concepts, beliefs, and aspirations into a common framework to facilitate class discussions. As students master these first tools, more abstract and philosophical approaches are introduced. The first two tools are designed to facilitate a broad understanding of potential futures and to help develop the individual student's perspective on the future and on his or her relationship to perceived futures. The next four tools focus on institutional and societal change, and the last three

tools emphasize the philosophical and meta-physical responsibilities of the individual. These nine tools were chosen based upon my previous experiences in three different classes - an earlier offering in futures studies, an information policy class, and a conservation geography class. The tools represent techniques that were most useful for students in internalizing a variety of concepts and techniques that were useful for me in the conveyance of deep sentiments in an academic context. Assignments associated with each of the tools alternate between individual exercises that are fairly straightforward to complete and group exercises that involve a bit more complexity.

Tool 1 -- The 200-Year Present

This approach was introduced in Boulding (1978). It places our current experience of the present day within the nexus of (a) information about the world that has been passed down to us from the elders we know personally and (b) imagination about the world that we may exist in when we are elders and have grandchildren of our own. Students receive an individual homework assignment during the first week of class in which they are asked to interview their grandparents or the oldest people they know regarding the quality of their lives when they were children, the changes they have witnessed during their lives, their assessment of the world today, and their prognosis for the future. Students then partake in the first of four group assignments in which they rotate the duty of editor. In this assignment they compare the results of their individual interviews and synthesize their major findings in a brief report shared and discussed with the rest of the class via web-based discussion boards. Common themes that emerge include technological innovations, the speed of modern life, and changes in values associated with community, simplicity, or self-sufficiency. During the second homework assignment, individual students generate their own fantasy interviews playing the role of elder rather than interviewer, and have an opportunity to identify whether their vision of the future is optimistic or pessimistic. Generally, students find the first exercise to be very stimulating, but the second

one to be challenging to the point of frustration. They are thus well-positioned for the use of the second tool that facilitates a more coherent organization of their perceptions of multiple futures.

Tool 2 -- The 3 Ps (Probable, Possible, and Preferable Futures)

Amara (1981) introduced the concept of probable, possible, and preferable futures. I use a more narrow definition of each of these "3 Ps" than is commonly found in the literature. I define the 3 Ps using two continua between the probable and the preferable - a quantitative/qualitative continuum and a temporal continuum. The first continuum has the probable futures being those futures that are based primarily upon quantitative data. These futures are "model-able," typically with computer software. The input to these models could include population growth rates (varying nationally), consumption trends of renewable and non-renewable resources (ranging from trees to oil and precious metals), and the capacities of pollution sinks (oceans, groundwater, and atmosphere). The output from these models is similar to the results generated by the simulations associated with *The Limits to Growth* (Meadows et al., 1972), *Beyond the Limits* (Meadows et al., 1992), and a variety of other approaches reviewed by Cole (1997). These types of models also address deforestation and fragmentation trends with output oriented towards projections of biodiversity loss. Likewise, a variety of global circulation models yield variable results in extent and timing of global warming. Although the variables and algorithms used in various models are debated by the scientific community, in general, the modeling approach has great credibility. On the other end of this first continuum is the conception of preferable futures. This work is done in a purely qualitative fashion. It is idealistic rather than realistic. Thus, there is a credibility continuum that is identical to the quantitative-qualitative continuum - the more qualitative and idealistic end of the spectrum of the 3Ps is the component that draws the references to futures studies as a crystal ball-gazing discipline.

The second continuum is temporal.

Probable futures are typically short-term forecasts (5-20 years) and are heavily reliant on the assumption that the near future will be very similar to the present. Thus, data and trends associated with present and recent conditions are useful in modeling, and the results are rarely controversial. It is within this domain that futures studies has much overlap with the discipline of planning and that futures studies got its initial disciplinary start. Preferable futures tend to span much longer time spans. This may be due to the utopic nature of preferable futures – few believe that they can be reached any time soon, so 100 years or more would not be atypical for such futuristic "visions."

Possible futures stand in the middle on both of these continua. They tend to mix quantitative and qualitative methods in an effort to go beyond the near future. There is a recognition that the element of surprise is more likely to be a factor in modeling the future, if the time span is on the order of 50 years. Thus, there is less confidence in the performance of possible futures, but they can be used to map out the range of conditions that can be anticipated. Such projects will often use the term plausible futures, not necessarily expecting any one of them to be privileged to occur, but knowing that any of them could occur. This approach is much less associated with predictions (as are probable futures) and more oriented to the deployment of scenarios. Typically, a variety of scenarios are generated using the worst-case and best-case outputs from the probable models to "bookend" possible outcomes. The normative component of preferable futures is often more palatable within this context, because it is but one in a number of possible outcomes, and it is not perceived as excessively idealistic. Likewise, the need to pursue a utopic solution may become more apparent, because it is contrasted to a dystopic outcome. There is benefit to generating multiple scenarios between extreme conditions for several reasons. First, by identifying the best and worst case scenarios, there is a very good probability that reality will match something "in-between." Second, there is educational value to portraying a range of possible conditions, in order to display the range of outputs associated with modeled

futures and in order to identify possible policy actions needed to avoid the worst-case results. Finally, "muddling" towards the future is the most likely approach to be taken, unless surprise or crisis forces more serious changes. A centrist scenario is most likely to mirror the conditions of muddling. However, placing the centrist scenario in the context of extreme futures may provide policy guidance on signals of progress or deterioration if conditions associated with either extreme are encountered early.

Prior to the assignment for this tool, students are asked to broadly identify their topics for their term papers. Students are then assigned to groups with other students working on closely related topics. Each student is then asked to apply the 3 Ps to their paper topic. At this stage, students are not expected to collect or even know about all of the data sources that could be used to model their probable futures, but they are expected to ponder the data that would be needed. Likewise, students are not expected to generate multiple scenarios for possible futures, but they are expected to define the parameters that might be addressed in a single best-case and a single worst-case scenario. In terms of preferable futures, students relieve some of the frustration associated with the previous assignment both by developing an utopic future and by focusing on a single area rather than on multiple themes concurrently. Students are then asked to work as a group to synthesize their individual assignments, placing emphasis on the processes associated with each of the 3 Ps, rather than on attempting to summarize content associated with individual domain areas. These group documents are posted to the class website, and similarities and differences between group experiences are discussed. Typically, students find there to be a disconnect between probable and preferable futures that possible futures may or may not serve to bridge. Thus, students are well prepared to investigate the elements of individual and societal choices that have suddenly become more apparent in the degree of their impact upon future outcomes and that are an integral component of many of the following tools.

Tool 3 - Reform, Transform, or By-pass

Changing the choices that we as a society make means changing the behavior of our major institutions, whether those behaviors are market practices or governmental policies. This tool was influenced by a typology of developed by Dahle (1998), and asks students to identify their degree of confidence in and loyalty to "the system." Transformers focus on changing the society, by-passers focus on building a new society, and reformers focus on changing the behavior of the government and the market. Reformers tend to allow that the system is flawed, but they believe that it is repairable. Their motto is "you must work within the system to change the system." Transformers hold that the system is hopelessly broken and needs to be totally re-engineered, however they find that some of the parts in the existing system may be recycled. By-passers abandon the existing system to the extent that they possibly can and work towards the creation of alternative communities. By-passers tend to be apocalyptic, expecting imminent, or at least eventual, collapse of the system. If the operating myth is the phoenix to arise from the ashes, then by-passers expect to be a shaping force in the identity of the phoenix.

An individual assignment is provided in which students are asked to identify the category with which they most strongly identify, and to list examples of organizations or actions associated with each of the three categories. It should be noted that crossover categories (reformer/transformer or transformer/by-passer) are common and that students often indicate changes in their self-designation as the semester unfolds. Likewise, individuals may find that they

are more predisposed to switch categories according to different lifetime phases, i.e., youth or retired may be more inclined to be by-passers, and householders may feel more obligated to the system during the peak of their careers. This tool is intentionally employed prior to Tool 4, because of the bias of the instructor for a transformative approach that becomes quite obvious in the presentation of the following tool.

Tool 4 -- Paradigmatic Trichotomies

This tool utilizes the context of paradigm shifting to address the societal leverage that needs to be applied in order to successfully shift away from possible dystopic futures and towards preferable utopic futures. The dominant paradigm associated with the worldview of corporate globalization is disclosed as unsustainable and at the root cause of so many systemic failures; it is presented as an unwise culture that we must transcend (Slaughter, 1995). In order to reveal the nature of the dominant paradigm, we tend first to portray the historical antecedent to the current paradigm (whether it be perceived to be agricultural, tribal, or matriarchal) and then to select and champion an emerging body of thought that we hope will either displace the current model or be in position to carry humanity forward in the event of total systemic collapse. Thus, presentations of paradigm shifts are often trichotomized into the anachronistic, the current system, and the desirable. Three different trichotomies are examined, each characterizing historical phases and cultural constituencies in a way that calls for societal transformation (Table 1). Each trichotomy can also be viewed as having past, present, and future components.

Table 1. Paradigmatic Trichotomies

After Quinn (1999)	Abdullah (1999)	Ray and Anderson (2000)
Leavers	Keepers	Traditionals
Takers	Breakers	Moderns
Seekers	Menders	Cultural Creatives

The first trichotomy examined was put forth in the fictional Ishmael series (Quinn 1992, 1996, 1997). In this typology, "leavers," or hunting and gathering members of pre-agricultural society are contrasted to "takers," who imple-

mented a set of power relations that forced one class of people to till the land while another class kept the harvest under lock and key. In Quinn's model, the industrial revolution and information revolution characterized by Toffler (1981) as ush-

ering in distinctive paradigms are simply different levels of impact of the consumption patterns and environmentally destructive behaviors of the taker mentality. Quinn (1999) does not call for a reversion to hunting and gathering, but he does call for an abandonment of the dominant culture through the creation of new tribal organizations, and I define those who engage in the pursuit of this new culture as "seekers." The pedagogy of beginning with the leaver-taker-seeker trichotomy serves to place the concept of paradigm shifting in the broadest possible historical context. Additionally, it serves to exemplify the category of people who wish to change the impact of our current society by way of by-passing it.

The second model reviewed was developed in Abdullah (1999). This model has a temporal component to it, but seems more sociological than historical in its treatment of paradigms, in that it describes different constituencies that co-exist in modern society. The past is represented by the "keepers" who protect the "old ways." This includes indigenous peoples and the body of wisdom from which we should learn before it disappears altogether. The dominant society is comprised of "breakers" who are destroying the environment and the fabric of all other cultures and creating a homogenized culture full of violence and despair. The emerging category is that of the "menders." Menders do not envision a return to keeper ways, nor do they generally advocate abandoning the system, but rather believe in working within the system to heal the damage. The major principles that they work for are inclusivity and simplicity to create a world that "works for all."

The third model investigated is the "cultural creatives" (Ray and Anderson, 2000). This team, comprised of a sociologist and psychologist, examined longitudinal survey data for over 100,000 Americans. They used these data to characterize an emerging set of values held by a group they labeled cultural creatives, an estimated 50 million Americans. These values include a global or synoptic perspective on issues such as the environment and women's rights, a propensity for the arts, self-actualization and activism, and a reluctance to be pigeon-holed into either a liberal or conservative political party. The cultur-

al creatives are contrasted to the mainstream "moderns" and to the conservative "traditionals." The moderns believe that the system is working well and that the status quo should be maintained. The traditionals hearken to simpler times and lament the fading sense of community, but also believe in strict lines of authority and fundamentalism.

Although they are by no means synonymous, the traditionals, keepers, and leavers share the minority perspective of the past. Modernists, breakers, and takers represent the present - they are in the majority, in power, clearly making a mess of things, and are often oblivious to the existence of the problem. Cultural creatives, menders, and seekers claim to represent the future, are also in a minority, will often cite the concept of critical mass, and can be expected to quote Margaret Mead on not underestimating what a handful of people can do to change the world.

In an individual assignment, students are first asked to identify examples (within the domain area of their paper topic) of activities, social processes, or organizations that are reflective of each of the components of the trichotomy of past, present, and future. Then they are asked to provide an essay response to the following questions: "Is a paradigm shift necessary to implement your definition of a preferable future in your domain area?" and, "Are we currently undergoing a paradigm shift or is this just rhetoric on the part of creative-mender-seekers?" and, "If a shift is underway, what evidence do you see to support that position?" and finally, "If a shift is not underway, what would be an example of an event that would indicate that we have actually begun to shift?"

Tool 5 - Transformative Back-casting

This tool requires suspension of all dystopic futures. That we could fail as a species, and either foul our ecological planetary nest or destroy ourselves via our nuclear or bio-chemical arsenals, is conceded as a very real possibility. However, students are asked to set aside, just for the purposes of this exercise, all doubt, skepticism, and cynicism about humanity's ability to perform a full paradigm shift. Students are

requested to recall their preferable futures and to imagine that we actually achieve a sustainable and harmonious existence on a planetary scale. What kinds of changes must have occurred in order for us to have reached such a transformation? Students are asked to work backwards from this utopic point, designing a flowchart or sequence of events that resulted in this desired future. Emphasis is placed upon the identification of potential "early signals" of such a tide change including current organizations, websites, or individuals that could be harbingers of positive futures. Each individual is expected to bring their work within their thematic domain to their group, so that the group editor can summarize the similarities and differences in the approaches taken by the individual members. This document is then posted to the discussion board, in order to compare the results of different groups.

Tool 6 - The Rail Ties

The metaphor of a railroad is used to characterize the parallel tracks of personal and societal transformation. The rail ties which both support and hold in place the rails of personal and societal "work" are to be found in our communities, networks, and organizations to which we contribute. These ties provide a link between the individual and the entire world that: (1) help to express and shape our individual identities, (2) enable us to do our part in crafting a world of our choosing, and (3) are experienced at a scale that is relationally meaningful and that is conceptually manageable.

This tool links societal change to the development of consciousness at the level of the individual. The tool builds upon a Buddhist concept, *Paticca samuppada*, which refers to the dependent co-arising of all phenomena (Macy, 1991). Neither humanity nor the world is seen as dominant, but rather each is reflective of the other. The consciousness of humanity is mirrored in the world, but not from a causative or supernatural role. The evolution of the consciousness of humanity is tied to our relationship with the world. This includes our social context as well as the biophysical environment. Thus, one can only benefit the world by working on one's self, and

one cannot work effectively on one's self in isolation. Therefore, the conscious soul daily travels between the spiritual vista of the mountaintop and the valley of human activity.

The doctrine of *paticca samuppada* provides a mechanism to begin to internalize the scientific paradigm shift that began in the early twentieth century. Comprehension by disciplines other than physics regarding the theory of relativity and the interchangeability of matter and energy has led directly to various exciting advances including chaos theory and systems theory in the natural and physical sciences. Likewise, within the social sciences, the theory of relativity has led indirectly to advances in postmodernism and to the unraveling of positivism. This makes for a condition that allows science to reevaluate the balance between the objective and the subjective, the inner and the outer, the personal and the planetary - all at the heart of the implementation of *paticca samuppada*.

The assignment associated with Tool 6 is the fourth and final group assignment. In this exercise, students begin by listing individuals that have had direct impact upon large numbers of people in the world. These tend to include people in a certain position, such as those currently in the papacy or the oval office, business leaders (such as Bill Gates) or those in film, television, or music industries (such as Stephen Spielberg, Oprah Winfrey, or John Lennon). The second phase of the assignment is to identify people beyond family members that have been most influential in their lives. At this point, school teachers, mentors, religious leaders, and other sources of inspiration at the community scale are acknowledged. Finally, the students are asked to compile a list of the organizations in which they have been engaged during the course of their lives that have served, in any way, the advancement of society at large. Group summaries of the responses to these three questions are then posted to the class board for evaluation and on-line discussion.

Tool 7 - The 4 Centers (4C)

This tool focuses on the individual, and works to identify methods for an individual to make conscious contributions to societal trans-

formation. The tool is based upon a blend of three different systems in which developing consciousness is a central objective: the Fourth Way system, Yoga, and Taoism (Table 2). The first system, the Fourth Way approach, is based upon the work done by Gurdjieff (Ouspensky, 1954; 1957). In this system, humans are understood to be such creatures of habit that we are like automatons only responding to stimuli, and we are far from crafting our world out of conscious choice. One of the tools for "waking up" is to become aware of our three primary centers of experiencing life. These centers can be understood as epistemologies or ways of knowing and interacting with the world. The third epistemology, or way, is the one most dominant in our culture – the intellectual. The first way is physical. Individuals in whom the physical center is strongest would rather learn by doing than listening and would much rather be engaged in an activity than talk about the plan. The second

epistemology is emotional and is least honored in western culture. It should be noted that everyone uses all three centers constantly, but almost all individuals develop one center to the exclusion of the other two centers. Although many of us develop a second center to a reasonable degree, few of us are balanced in our instinctive, intuitional, and intellectual capacities. One metaphorical tale that helps students to retain the major characteristics of the four centers is from *The Wizard of Oz*. The scarecrow represents the intellect, the tin man depicts emotion, and the cowardly lion embodies physicality. Dorothy is unable to reach Oz and thus return home (consciousness) without the company and service of all three of her companions. The Fourth Way approach fosters personal awareness of each of these centers in order to work from each one consciously, to bring the three of them into balance, and thus to open a fourth center, one associated with consciousness.

Table 2. Consciousness Systems Used in 4C Tool

	4 th Way (centers)	Yoga (chakras)	Taoism
C1/instinct/actions	Physical	Survival	Dualism prevails; Doing emphasized
C2/intuition/emotion	Emotional	Sexual/relational	
C3/intellect/thoughts	Intellect	Power/intellect	
C4/insight	Consciousness	Spiritual love	Unity prevails; Being emphasized

The second system within the 4C tool is based upon yoga, specifically, four of the seven chakras that are located along the human spine (Dass, 1971). The first chakra is associated with human survival. The second chakra is associated with sexuality, relational skills, and emotions. The third chakra is associated with power and intellect. Although numerous descriptions of chakras seem to differ on the details of the functions of the first three chakras, they seem to universally concur on the role of the fourth chakra – the heart chakra – as the seat of love. This is not to be confused with passion (eros), but is the unconditional love (agape) taught by the founders of the world's major religions. This spiritual love engenders devotion, bliss, and a sense of unity with others. Dass (1971) equates love with consciousness, but Gurdjieff and

Ouspensky seem to focus more on consciousness than love. In other respects the four centers seem to run parallel with the first four chakras.

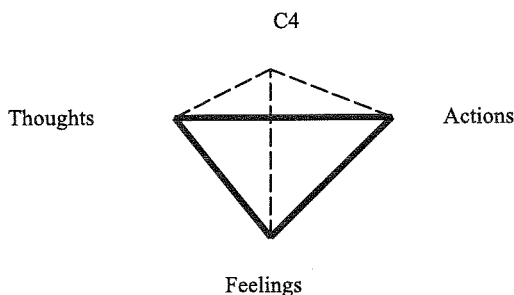
The third system used is Taoism. Here the dualism associated with active energies (yang) and receptive energies (yin) are understood to emerge from a non-dualistic or unitive state, the Tao. The Tao can be experienced through a type of knowing in which the person no longer feels separated from the object being known, the two are literally one. We have all had glimpses of this state of being when the ego disappears, when everything seems to be righted, and when it becomes fully apparent that the quality of life is more dependent upon perspective than circumstance. Maslow (1964) referred to these as "peak experiences" and built a psychology of self-actu-

alization around a life that stays at the peak. These flashes are what the perennial wisdom from many cultures tells us to be always available to us if we were but to be conscious. Actions that are motivated from an awareness of the Tao evoke harmony and restore balance – worthy goals for both the personal and planetary transformations addressed in the rail tool. Actions that emerge from within the constrained space of dualism are understood to reinforce rather than relieve problems. Emphasis is placed upon being rather than upon doing, with the most appropriate actions becoming evident from a perspective of unitive consciousness.

The 4C tool draws on each of these three systems. The primary assumption is that in working towards personal and societal change, our thoughts, feelings, and actions should be aligned and conscious, rather than imbalanced, automatic, or reactive. Additionally, actions that are guided from consciousness (flowing from the heart center to the other centers) are more likely to be effective than thoughts, feelings, and actions that originate from the first three centers. The 4C tool makes a geometric shift to the chakric model, and thus makes it more synonymous to the Fourth Way approach. Rather than

envisioning each of the first three chakras as they occur in the human body along the line of the spine, they are conceptualized as three points in a triangle, with each point being at the same level. This counters a very subtle notion that intellect (C3) is superior to instinct (C1) or intuition (C2) because it sits above the other two along the path to the "higher" centers. The triangle is also used to exemplify the way we tend to go around and around endlessly from thought to feeling to action and back again. Further, one can conceptualize the fourth chakra as being centered between (balanced) and above (transcendent to) the other three chakras. The three-sided pyramid allows for the addition of the conscious perspective (C4) to bring life from a two-dimensional trap to a three-dimensional experience. Likewise, it characterizes the quantum jump that need be made to attain a unitive state, and the loss of perspective that occurs when one slips from the heart center into a state in which attention gets "stuck" in any one of the three lower centers.

It should be noted that the C4 perspective is reliant upon each of the three base points. Thus, the mind is not to be denied, as is suggested in many spiritual paths, but balanced.



Additionally, valorization of the emotional center over the intellectual center is to be guarded against. Just as an excessively intellectual approach can be sterile or divorced from reality, an excessively emotional approach can succumb to the trap of dogma. In the 4C approach, nothing is to be taken upon faith, but rather positions should be grounded in experience and verified using the intellect.

The assignment associated with the 4C tool

is three-fold. First, students are asked to identify their primary and secondary centers. Second, they are asked (1) to describe a single aha! moment, flash of transcendence, or a peak experience that they have had and (2) the conditions that might have led to that experience or actions that may have been inspired as a result of that experience. Finally, students are asked to list actual or imagined examples of C1, C2, C3, and C4 interactions or perspectives associated with

their specific thematic topics.

Tool 8 - Metaphor, Myth, and Image

This tool is designed to evoke a variety of symbolic representations in order to see the past and present in the broadest terms possible and to identify patterns that might be useful in better envisioning the future. The metaphorical approach is introduced by looking at the historical development of human society within the context of human life stages. If we are in our adolescence (experimenting with our strength, enamored with technology, prone to take risks, having a sense of invincibility, and often self-destructive), then there is hope that we may grow out of this awkward phase and into a more "advanced society." Another metaphor that is used throughout the semester is that of our species as a single critter – are we fouling our planetary nest?

Mythology is replete with useful lessons for envisioning futures dilemmas and potential solutions. The myth of the phoenix rising from the ashes has already been referenced in terms of societal collapse and resurrection. The myth of Icarus is viewed to ponder the role of technology as an unbridled force - Icarus was given wings crafted of wood, wax and feathers by his father Daedulus who warned him not to fly too close to the sun, which of course he did and died after the wax melted. What are the internal dangers of our current technologies (e.g., 250,000 years is a long time for plutonium waste to be contained)? Who are our elders, what are they saying about unbridled technological advances (e.g., genetically modified foods), and what do we risk if we fail to heed their warnings?

Imagery is very potent in its ability both to encapsulate a lengthy description and to evoke an emotional response. A few images from the twentieth century can be sequenced rapidly to reveal so much of the quality of the century - Model T Ford, Kitty Hawk, swastika, mushroom shaped cloud, Einstein, Gandhi, Elvis, Mickey Mouse, Krushchev banging his boot at the UN, the Beatles, peace sign, Woodstock, Martin Luther King, Jr., earth rise from Apollo 17, IBM and Apple Computer logos, the golden arches,

Vietnamese monk performing self-immolation, teenage dissident facing down tank in Tiananmen Square, smart bomb hitting target during 1991 Gulf War, The Star Child from Kubrick's 2001, etc. Processing visual imagery utilizes a different part of the brain than verbal information and may increase our capacity for holistic thinking (Shlain, 1998). Combining a visual approach with metaphorical and mythical devices opens up a creative way for representing our current conditions and stimulates a long and broad view for examining potential futures. Likewise, the metaphor-myth-image tool can serve to link patterns that are perceived between domain areas. For example, when examining the energy and biodiversity domains concurrently, I am struck by the irony that the very carbon in the biomass of the life-forms associated with the sixth major extinction wave 65 million years ago during the demise of the dinosaurs is now being unearthed to "fuel" the industrial engine responsible for the population growth and consumption rates directly causing the biodiversity loss of the planet's seventh mass extinction.

In the assignment for this tool, students are first asked to list any metaphors and myths that exemplify their domain area and to draw or collect copies of any images that might be useful to supplement that list. Then they are asked to ponder their domain issue while reflecting upon the metaphors and myths and while looking at these images and to describe any new insights that they have had on their research topic as a result of this vantage point.

Tool 9 - The Summit

This tool is designed for those in the class who have identified themselves as transformers (Tool 4). In many respects it is the internal side of the practice of *paticca samuppada* that was introduced in the context of the rail tie (Tool 6), which works on developing the external practice of *paticca samuppada*. By-passers and reformers could find it useful on a personal basis, but are less likely to find it relevant on the societal level. The summit tool is beneficial for transformers, because they are inclined to hold that anything less than the creation of an enlightened society

is an insufficient level of change for the future of our species. Thus, enlightenment needs to be de-mystified and made much more accessible to the population at large or "critical mass" will never be achieved. One approach to this end is the de-throning of the concept of enlightenment as a state to be achieved by a handful of masters. In contrast, enlightenment should be perceived as the journey itself, and there is a realization that we are all on this journey together. In typical Zen fashion, one sees the summit when one realizes there is no summit. This is also supported by process theology (Griffin, 2001), which perceives God as verb (the act of creating, seeking, or loving), rather than as noun (subject of creation or object of devotion).

The summit tool focuses on the integration of personal and societal levels and on the intersection of grand vision and tangible action. The metaphor of the summit is used for two reasons. First, it takes work to hike to the summit – the vista does not come without effort. Second, the summit is usually enjoyed in solitude or in the quiet company of a few fellow travelers. It is only by going deep within that we are able to develop the consciousness necessary to balance our thoughts, feelings, and actions. It is only by searching our souls that we know into which rail ties to channel our energies to link personal and societal transformation. However, there is also a lovely by-product of the journey to the summit – we are refreshed. The hubbub of the valley is distant and the din of the city is not heard. For a moment we are at peace and all is well. In fact, there is the notion that everything is perfect, just as it is. Nothing need be done. From this place, where being displaces doing, any action taken up is just as fine as any other. And the best action is the one that we simply are drawn to take, all the time recalling that nothing need be done. The operational adage is "chop wood, carry water, enlightenment, chop wood, carry water." Nothing changes in terms of behavior after returning from the summit, but the perspective has shifted. We can carry the union internally attained while operating in the external world. The eagle embodies the type of vision needed in this tool – it can soar at great heights and take in a synoptic view and at the same

time, pick out a mouse on the landscape. Such a split level view enables us to concurrently look at both the probable future and the preferable future and to see reality but hold onto the ideal.

The assignment for the summit tool is optional. Students are instructed to identify what conditions might best serve their own internal journey, whether that be a solo wilderness camping trip, a day alone at the beach, or an afternoon or evening in which arrangements are made to have the house to one's self. While engaging in a long meditation, a day of reflection or a long stroll on the beach, students are asked to examine the story of their life, their talents, their distractions and "detours," what they would do to serve if money were of no concern, and what they would like to have someone be able to say about them during a eulogy at their funeral service some 50 years in the future. Finally, students are asked to ponder whether they feel that they have found their calling, what obstacles need to be overcome to fulfill their lifework, and what bearing, if any, this perspective has on their research topic. Due to the optional and personal nature of this tool, assignments are not collected. However, an on-line discussion board is created on callings and lifework.

Application of the Nine Tools in Evaluating Potential Futures of Biodiversity

Although the application of the 200-year present through the interview and imagining processes is very general and works on multiple issues, there are a few observations that can be made upon domain-specific themes, such as biodiversity futures. The childhood of our elders still had frontiers, and knowledge of many wild places was brought to the attention of the public often only through the pages of *The National Geographic*. In 1900 only a handful of national parks had been formed. We operated in a frontier economy in which resources were perceived to be limitless and nature was more than capable of handling all of our wastes. Within the span of 100 years, we find the world to be rapidly filling with all but a very few frontiers closed, resource limitations are apparent, and pollution

of air, surface water, groundwater and oceans has surpassed levels of alarm. Terms such as sustainability, spaceship earth, greenhouse effect, and mass extinction have entered the common vernacular. Biodiversity loss seems to be acknowledged as a major global environmental issue, but international funding to prevent deforestation is but one piece of the international environmental budget, one that reflects the political reality that economic and military concerns far outweigh environmental concerns. Today, a growing proportion of forests are monocultural and exist purely for timber production. Scientists are scrambling to inventory what species are out there as thousands of species are slipping into oblivion before even being inventoried. Numerous biodiversity hot spots have been identified around the globe and conservation efforts seem to be focusing on these areas, but remnant forests and wilderness areas are starting to look like an archipelago within a sea of urban and agricultural development. It is conceivable that our grandchildren will know a world where biological diversity exists in a natural state only in those select areas, and even these large "zoos" may be more likely to be considered pharmaceutical mining reserves. Likewise, it is conceivable that science and technology will too regularly provide the last hope for some species via test-tube storage of DNA or some other form of genetic technologies.

The 3P tool offers the possibility of offsetting probable futures with preferable futures, but let us examine first some of the quantitative methods that have been deployed in diagnosing probable biodiversity futures. One way to grasp the effect of the rate of change of human population growth on biodiversity is to look at a few global totals. In 1900, our species commanded 10% of the world's terrestrial net primary productivity (NPP, or amount of biomass on the earth's surface), but in 1980 over 40% of the NPP was used to support human consumption patterns (Vitousek, et al., 1986). During the same time-frame that our demand of NPP increased four-fold, our population tripled from 1.6 billion to 5 billion. If this trend were to continue, human capture of 100% NPP (nothing on land would live, but to serve us) would be reached by the time

our population reached 12 billion which some population growth models show occurring by the year 2100. As we move closer to this time, ecologists are likely to be asked how many and which species need to be preserved to ensure human survival, or to put it metaphorically, just how much of the web of life can we destroy before we die? We now move from the NPP model, which does not take into account such variables as population concentrations in urban areas or consumption patterns in specific countries, to more specific estimates, based upon trends associated with biodiversity hotspots. Conservative estimates of future biodiversity loss indicate that 10% of current species will be extinct in 20 years. On the other extreme are projections that predict that 50% of current species will be lost in 50 years.

Regarding preferable futures, we obviously have to halt population growth and the consumptive ways of our species. There are two ways that this could be accomplished - proactively through choice or reactively under duress. The first approach would entail an abandonment of the urbanization our planet has gone through over the last 200 years with progress towards a low-impact settlement pattern. There would be extensive cooperative arrangements in housing, commerce, and recreation, and there would be ample green space. The problem here is that humanity would be uniformly spread over the planet and raw nature is likely to be replaced by gardens, parks, and zoos, none of which can approximate the species diversity found in undisturbed areas. In the second approach, humans could eliminate suburbs and concentrate more tightly in the cities and away from the remnant biodiversity. This gives natural areas a chance to continue to recover and spread. The problem here is that urbanization is highly linked to consumption and it is unlikely that the net effect on nature can be curbed without severe rationing imposed from a centralized power.

In modeling possible biodiversity futures, the first assumption is that, in the near term, biodiversity will continue to hold a very low priority in policy circles with matters such as war on terrorism, attempts to buttress unsustainable eco-

conomic growth, and protection of global markets holding much higher sway in the international arena. Thus, using a probable futures approach, current rates of population growth, suburban sprawl, and deforestation can all be expected to hold. The second assumption, also associated with a probable future, is that extinction rates are likely to continue for the foreseeable future at either a conservative or an exaggerated rate (it only makes a difference in timing not net effect) until the worst-case scenario is reached. Thus, the third assumption is that the preferable future associated with individual enlightenment cannot be reached unless there is massive societal transformation, which can only be expected through either total collapse of our planetary political and economic systems or through some form of surprise. An approach of "muddling through" does not seem to be effective here, because it only delays the timing of ecological crisis, it does not prevent it. So there are four choices for possible futures: (1) foul the nest, game over for humans, roaches win (2) austere control, after the point of no return is recognized on an immediate and undeniable horizon, dystopia becomes reality (3) phoenix from the ashes, human societal collapse occurs early enough for nature to survive in a form that is recognizable to us today, (4) a surprise occurs and our society becomes more enlightened.

In terms of the reformer, transformer, and by-passer approaches to biodiversity, by far the majority of conservation activity is in the reformist context. Government agencies enforce conservation legislation and non-governmental organizations lobby for more strenuous law. Science oriented to study and protect biodiversity is funded through government agencies. No matter what radical influences an individual biodiversity advocate might have, their actions are typically directed to working through the system to minimize biodiversity loss, and there remains the hope that things can get better through such actions. The legacy of transformers in the conservation arena is scant, but could include such efforts as debt-for-nature swaps and ecotourism ventures. Likewise, there have been several integrated conservation and development projects (ICDPs) that have worked to empower local resi-

dents in park management. Yet, the most significant impact may be occurring through changing our consumption patterns, as in the voluntary simplicity movement (Elgin, 1981) or in the focus on greening industry, such as can be seen in industrial ecology. By-passers may contribute to the preservation of biodiversity within one corner of the world. However, they are more likely to be involved in simply adopting a lifestyle that is less ecologically destructive.

The past, present, and future emphases reflected in the paradigmatic trichotomies are useful in teasing out different constituencies within the conservation community. The influence of the preservation movement of the late 1800s can still be seen in purist attempts to maintain the sanctity of wilderness areas for their beauty and intrinsic value. The present modernist mode is reflected in conservation programs that are designed around utilitarian values - renewable resource extraction and recreation services are managed for their utility to the human system. The Green Party, with its avowed alliance to systems theory, its ability to focus upon social and environmental issues, and its tendency to bring coalitions to consensus (Graham, 1998) is indicative of a creative-mender-seeker mindset.

Applying a transformative backcast from a preferable future begins with envisioning a future in which the human system is in balance with the natural system - biodiversity loss would then occur at its natural rate. Such a society would have developed some form of world governance that is actually funded and empowered regarding environmental issues, at least those issues that need to be handled at global or international scales. One early signal, yet in our possible future, could be the creation of a global carbon tax, collected from countries that have the highest carbon emissions and distributed to those countries with the greatest carbon sinks. This would not only be a way to generate funds for environmental restoration, the distribution of the funds could provide an incentive for countries to receive carbon tax revenues by making their allocation contingent upon meeting deforestation standards. Another signpost of progress towards a transformative future would be the

adoption of measures that would ensure corporate accountability. For example, if capital punishment were applied to a corporation guilty of intentionally taking life for profit, then its CEO would be fired, stockholders would lose their shares, and the assets of the corporation would go to a global justice fund (Morris, 1998). At that point one could imagine that ethical considerations regarding the environment would be more likely to influence corporate practices. One potential early signal is the institution of the round tables on environment and development that have been implemented in Canada - these are based upon multi-stakeholder, participatory, and consensual decision-making. Another contemporary early signal is the growing interest in the voluntary simplicity and the cultural creative movements.

The key with the rail tie tool is in seeing the connection between the individual and the societal at the community level. Each of the ventures listed above can be worked upon in any of a number of organizational contexts. The trick is to move beyond the paralysis of analysis and to take action. Commit to being an active part of the solution - sign a petition, get the panda bear sticker, buy a share in 1/32 of an acre of rain forest, visit the rain forest on an eco-tour. It does not matter what you do - just do something.

The four-center tool requires that any of those actions taken be performed consciously. It is difficult to describe the nature of thoughts, feelings, and actions that are imbued with consciousness, because it is such a subjective phenomenon, and only the individual can judge whether he or she is being conscious. However, regarding thoughts, feelings, and actions associated with biodiversity loss, it is possible to identify three examples of states in which instinct, intuition, and intellect are out of balance. For the first example, take the academic working on environmental issues. She may have had a strong passion that propelled her into the field, but in recent years she has spent most of her time "up in her head" with little time or energy left to feel much of anything, let alone to take direct action on a specific issue. As another example, take the well-meaning activist who runs around from one cause to the next, definitely engaged, but not

quite certain of the productive results associated with all of his activity. Or finally, examine the person who feels extreme despair about the condition of the environment, but really doesn't know what to do or where to begin, and thus remains literally overwhelmed and paralyzed, knowing little and doing less, but definitely in command of a reservoir of energy waiting to be channeled.

Moving naturally to the tool of metaphor, myth, and image, it should be apparent that our culture is seeing the resurgence of a variety of earth-based symbols. I shall address only one. I hold that the most powerful icon of the twentieth century was the earth-rise over the lunar landscape and the associated familiar photograph of the home planet taken from Apollo 17. This image reached the consciousness of the planet at a very deep level. For the first time in our human history we saw our habitat from a fully synoptic view. We saw a water planet with swirling clouds and that onion-skin atmospheric layer - all afloat in a black sea of space. Concurrent with seeing the fragility of the planet, we also saw a globe without borders. Philosophically, the icon of the home planet has two possible motions of focus, externally radiating and internally oriented. External focus moves from the fragile atmosphere outward to the dark space surrounding the planet. This focus indicates how vulnerable we are should we destroy our life support systems, and the key word is unsustainability. This focus is inherently dominated by emphasis on biological and physical systems. It also tends towards doomsaying which may be the psychological undoing of the environmental movement, in that excessive doomsaying could erode credibility in scientific projections and catalyze environmental backlash. The internal orientation sees unity - one world, one people. Unity as a goal suffers from the magnitude of the mission, requiring a level of unprecedented human cooperation for which there is scant evidence for hope. However, one must wonder if sustainability can be reached without parallel political efforts. At a minimum, the two motions of focus of the planetary icon offer a balance between efforts in science and policy, as well as between nature and society.

The final tool, the summit view, inspires us

to see the miracle of life, the perfection of the pattern of the diversity of life on this planet. We see the potentiality of humanity, both its barbaric and noble dimensions. We are compelled to return to the valley and take action to protect life on earth from ... ourselves. But first, we must bask, take in the view, and be healed, recalling that nothing need be done. It is imperative that we relax in the midst of apparent catastrophe. The Chinese word for crisis, *wei-ji*, is composed of two characters -- danger and opportunity (Capra, 1982). We would do well to ponder both daily.

Conclusions

The nine tools have proven to be effective in providing a framework for introducing futures studies techniques, for evaluating societal change, and for giving students a methodology to expand and to develop their perspectives on the future. Likewise, the tools have furnished a common structure for students to compare, in depth, their sense of the future to that of their classmates. The flexibility of the implementation of the tools in both a generic fashion, introducing quantitative and normative approaches, and in specific application to a variety of thematic areas, indicated the strength of the approach. Revisiting numerous topics with the same set of lenses enabled students to articulate complex issues in a seminar format. Even the more philosophical tools seem to be approachable, and generally students report that they were both more positive about the future and felt more empowered in reaching preferable futures as a result of having taken the class. Synergy was generated by viewing issues through futurist, sociological, and philosophical tools. It should be noted that some tools took a while for students to comprehend. Thus, the incorporation of associated assignments and the coverage of one tool per week allowed students sufficient "cook time" to internalize one tool before moving onto the next. The sequencing of the tools was of paramount importance, because of the inter-relationship between the tools and because of the ability to move into deeper territory as a result of having covering fundamental concepts earlier. At

times, during the teaching process, I became very aware of the quality of the thin line between teaching and preaching. Two useful antidotes for transgressing in this domain were (1) a healthy dose of humility, not difficult to find, given the uncertainty of the times and of possible futures, and (2) a desire to balance my need for maintaining authenticity with the task of helping students craft their own visions of their futures.

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