The Future Evolution of the Ecology of Mind

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Introduction: Basic Concepts

In this paper I describe an evolutionary and ecological perspective on human psychology, applying this theoretical framework to understanding human nature and the human mind, and demonstrate its implications regarding the future evolution of humanity. My central arguments are: This perspective provides an informative, thought provoking, and valid framework for explaining human psychology; it provides a set of general principles for predicting or anticipating future psychological evolution; and it suggests a preferable vision for the future of the human mind and for guiding our psychological evolution.

There is a set of central concepts within this evolutionary ecological perspective:

Ecological reciprocity, which applied to human psychology, entails that humans and the environment are open and interpenetrating systems and form an interdependent whole. Within a framework of ecological reciprocity there is no absolute boundary between humans and the environment and neither can be defined independently of the other. Mind, intelligence, personal self-identity, and even consciousness are ecological emergent realities realized in a supporting environment.

The idea of ecological reciprocity applied to human psychology derives from J. J. Gibson's ecological psychology. Gibson's ecological psychology is anti-dualistic – neither mind and matter, nor conscious subject and world, are ontologically distinct realities. Within Gibson's psychology there is a reciprocal connection between self-awareness and other-awareness, a reciprocal connection between awareness of persistence and change, and a reciprocal or interdependent awareness of the spatial arrangement of objects, including the perceiver's body, and the temporal arrangement of events in the world, including the perceivers' life – psychological space and psychological time are relative and ecological.[1]

A second key idea, building off of the first concept, is an ontology and logic of *reciprocity* as a basic theoretical construct in understanding natural reality. Based on the Taoist *Yin-Yang* view that existence is a set of complementary opposites, the idea of reciprocity treats all basic ontological distinctions as interdependent, mutually supportive realities. Instead of an either/or logic, reciprocity argues for a both/and logic of existence, subsuming an either/or logic. Reciprocity rejects and subsumes all forms of dualism; that is, the classic philosophical dichotomies are all interdependencies. Reality is both a one/whole and a many/plurality; reality is both stability (being) and change (becoming and

passing away); reality necessarily contains both order and chaos, which in effect depend upon each other. Pertaining to human psychology, individuals are both distinct beings yet interdependent, a synthetic combination of self-determination and environmental influences; humans are both free and determined in their behavior. The conscious self is both a unity and a diversity of voices – of both conscious order and chaos. Aside from the philosophy of Taoism, this basic idea of reciprocity derives from the work of the philosopher of time, J.T. Fraser, and the open systems theoretical scientist Ilya Prigogine.[2]

A third central idea, which also derives from the work of Fraser and Prigogine, among others, is that reality or existence is fundamentally *evolutionary*, and hence dynamical. Rejecting Plato's elevation of eternity and the primordial as the highest level of reality, standing above time (where time, in essence, is a "fall from perfection"), the evolutionary model of reality sees order, complexity, intelligence, freedom, uniqueness, consciousness, and other "higher" qualities increasing or amplifying through time.[3] Further, there appears to be a set of deep principles which describe the evolutionary process, such as self-organization, "punctuated equilibrium," and non-linear jumps in complexity occurring on the heels of extreme fluctuation, chaos, and bifurcation points.[4] As another general evolutionary principle, evolution as a process may be becoming more complex and efficient, and accelerating across time; that is, evolution is evolving.[5] Applying the evolutionary framework to humans means that there is no stable human nature or human psychology – it is in evolution and it is inherent in the very nature of the human mind to strive toward greater evolution.[6] We are, to quote Huxley, "evolution become conscious of itself." In the future one should anticipate jumps in human mental complexity and capacity and other psychological qualities and these jumps may occur at an accelerative rate. In this accelerative process, humans may disappear or self-transcend.[7]

A fourth key idea combines reciprocity and evolution. Order and chaos, stability and change, life and death, and freedom and determinism are all reciprocally coupled together in an ongoing process of progressive evolution through time.[8] All evolution is *reciprocal evolution* – things evolve together, pushing or instigating each other along.[9] Humans and the environment evolve interactively and interdependently as a total system, and in this context, the environment includes not only the "natural world," but the social environment and the technological environment as well. The theory of Gaia argues that the geological, chemical, and atmospheric components of the earth have co-evolved**,** interactively with the biosphere of life – a prime example of holistic reciprocal evolution; life moves the world as much as the world moves life.[10]

Finally, the last important idea is *purposeful evolution*. Humans are self-conscious (self-reflective) and self-evaluative beings with values and ideals; we think about ourselves and evaluate ourselves relative to ideals. Though interactive with the environment, humans are focal centers of control within the ecological system and attempt to direct evolution, both their own evolution and, in accordance with their values, the evolution of their supportive environment. This purposeful evolution is participatory rather than detached (or top-down), for humans are ecologically embedded within the reality that they are trying to

influence and, hence, exist in an interactive feedback loop with whatever they are trying to influence or guide; the ripples of our actions reflect back upon us. Barbara Marx Hubbard speaks of "conscious evolution" – to consciously direct our evolutionary future.[11] To greater or lesser degrees, humans have been attempting to do this all through our history, in accordance with our evolving values.

What is critical to see is that humans possess values, ethics, and moral principles – we have preferable visions, hopes, and dreams – and these preferential and ideal standards and goals are used by humans to guide and direct the future. As we increase our understanding of nature, human psychology, and the basic principles of change, and as our technological and psychological capacities increase, we should become more empowered and knowledgeable regarding how to guide our future evolution; one would predict that our values would evolve as well. But make no mistake – we are going to purposefully direct our evolution in the future as we have done in the past.

The History and Ecology of Human Evolution

"It is easier for us to imagine ourselves living among better appliances than among better human beings."
Mihalyi Csikszentmihalyi

Speculative visions of humans in the future, although often set in strange high-tech environments, usually portray humans, quite naively, as possessing the same type of psychology and mental make-up as they have today. It seems highly doubtful that this assumption about the future of human psychology is correct. Human nature is transformative and evolving, and not some single unchanging reality.[12]

The transformative and evolutionary nature of humans is clearly supported through evidence from natural history. Our evolutionary heritage over the last few million years demonstrates a series of significant biological changes and, of special significance, the size and complexity of the brain has undergone monumental changes. In so far as our basic psychology is intimately tied to the workings of our brain, our psychological capacities and traits have undoubtedly transformed as our brains have transformed. These psychological changes almost certainly have included all basic features of the human mind, from cognitive and linguistic capacities to affective, motivational, personal, and social dimensions as well. (As contemporary psychology demonstrates, the human mind is an interactive whole, and changes in one fundamental dimension impact changes in other psychological dimensions.) Archeological and paleontological evidence shows various ongoing developments in tools, habitats, behaviors, and artifacts accompanying and corroborating the physical and psychological changes. Further, biological and psychological evolution has not come to a standstill within more recent times since the emergence of modern *Homo sapiens*, but has continued, right up to the present; genetic evolution is ongoing

and modes of thinking and conceptualization have changed in dramatic ways in the last few thousand years. The static conception of humanity, argued for in creationist theories of the origins of humans, is totally contradicted by scientific evidence.[13]

Moreover, from an ecological perspective, it is clear that humans exist within an evolutionary universe. As beings-in-a-world, we are embedded within a multi-leveled natural context that is dynamical. Our physical and cosmological ambience (of elementary particles and forces, atoms, stars, and galaxies) has shown a history of evolutionary transformation; the chemical, geological, and atmospheric conditions of the earth have evolved across time; and ecology and biology are dynamic realities with a history of evolution and change. Though there are constancies, invariants, and laws at all levels of natural reality (but in fact these may have evolved as well), nature is levels of flow built on (or embedded within) more fundamental levels of flow.[14] We are beings of flow embedded within this universe of multitudinous transformations; we exist within a dynamical ambience**,** and surround a dynamic intrasphere. Even our more recent creations of society and technology, which make up additional parts of our ecology, are dynamical realities in evolution. Following from the principle of reciprocal evolution, if our minds – our psychologies – exist within a multi-dimensional dynamical evolutionary reality, then our psychological make-up must be transformative as well.

Given the dynamical quality of our existence, it is critical that humanity is defined in the context of time, change, and the future. The static image of human nature creates a timeless image of the human psyche. Without change**,** – we simply are what we are. But a dynamic vision of human nature – an evolutionary vision – brings time into the picture in understanding humanity. Humanity is a journey – an action or motion - of becoming and passing away**,** - rather than a set point. Any valid conceptualization of humanity should incorporate both past and future, producing a dynamical vision or a temporal *Gestalt*. Hence, just as history is critical, understanding humanity in the context of future directions and possibilities is also essential to defining our nature. Hence, following from this point, the future psychological evolution of humanity will be more like a story than some idealized end point.

Especially in recent history there have been innumerable fears expressed regarding potential future changes or transformations in humans, in particular, the idea that we might intentionally attempt to reproduce ourselves – the *Frankenstein* theme. We are, in essence, afraid of attempts at purposeful evolution. These fears have been repeatedly expressed in science fiction, though science fiction also has dealt with hopeful and positive possibilities as well. The static image of humanity reinforces – in fact – serves as the foundation for such fears of future transformations. As one argument goes, human nature is God-given and we should not attempt to tamper with the contents; another popular argument, often coupled with the first, is that humans are incompetent and flawed beings (morally) and hence, due to ethical deficiencies or a lack of wisdom, we will fail at any effort to improve upon ourselves. In fact, our efforts will backfire.[15]

But even more generally, there is a human tendency to fear the different or the unknown; hence, possible evolutionary changes – even if due to "natural evolutionary" processes – provoke fear and anxiety in us. In Greg Bear's science fiction novel *Darwin's Radio*, numerous factions of contemporary humanity react with fear, defensiveness, and hostility to the emergence of a new human species, one that occurs due to natural as opposed to intentional forces; we observe punctuated equilibrium at work in our own species and recoil from it.[16]

Pro-evolutionary or dynamical images of human nature – images that embrace change (and consequently uncertainty) as natural if not even desirable - lend support to purposeful physical, biological, and psychological transformations in humans. Static conservative images of human nature, which frequently also emphasize the importance of security and certainty, work against embracing either purposeful human evolution or any type of human transformation at all.[17]

As noted in the introduction, there are various generalized principles at work in evolution, such as punctuated equilibrium, the reciprocal interdependency of order and chaos, and the phenomenon of reciprocal evolution. I also mentioned that evolution was evolving and because of this change in the nature of change (more efficient modes of change), the rate of change is accelerating. It is a common assertion that we live in times of accelerative change – of increasing speed and frenzy – of accelerative complexity.[18] There are innumerable indicators of accelerative contemporary change, from levels of economic productivity, technological advancements, ecological transformations, demographic and social changes, etc.[19] Questions have been raised about whether or not humans are able to cope with the present speed of change, to what degree and in what ways there is ongoing resistance to change, and whether the rate and kind of change is positive or negative in its impact on the quality of life and the environment.[20] Yet some would argue that the exponential growth of complexity in human life is a natural consequence of cosmic evolution and we are simply riding the wave of the evolution of the universe.[21]

But one could argue that it is humans who are the instigators of accelerative change, putting us in the interesting position of struggling to cope with or adapt to changes in human life that we ourselves have provoked or created. If we are, in fact, the instigators of our own stress, then we could follow Bear's particular vision of human evolution; the stress and challenge of modern life is going to instigate evolutionary mechanisms within us to kick us forward in our own development in order to adjust and even flourish within the type of world that we are creating. This is a reciprocal or ecological feedback loop of change; we change the environment and our lives which provoke us into changing more within ourselves to deal with these environmental and social transformations. This reciprocal pattern of evolution will undoubtedly continue and repeat itself over and over again into the future. Change begets change which begets more change.

Purposeful Evolution

Purposeful evolution is a long-standing fact in the history of humanity and is a primary instigator behind the accelerative rate of change in our history.

Although it is frequently argued that, prior to the rise of modernity, humans had little, if any, concept of progress through time, the concepts of progress and of a positive direction to time go back to ancient thinking.[22] Furthermore, idealistic concepts and values, which humans should aspire toward and which define a more advanced way of human life (a preferable image of humanity and the future), can be found in all cultures around the world back into ancient times.

In both the ancient West and the ancient East a common conception of time was the cyclical theory of change, and a common philosophy of life was to aspire toward a harmony or balance with nature, Taoism being a prime example of both ideas. Yet in ancient Babylonia, in Zoroastrian cosmology, in ancient Judaic thought, and clearly in St. Augustine's vision of past and future, we find the concept of directionality in time – of a positive or progressive directionality in fact. Also, we find these images of temporal progress coupled with ethical ideals, of a sense of the good toward which humanity is (or should be) heading. In Zoroastrianism the moral directionality is the triumph of good over evil; in its Judaic and Christian offshoots it is the culmination of God's plan for humanity and the earth. In the East, we clearly find the idea of cycles of time, but we also find the general philosophical and spiritual aspiration toward realizing a better life, both individually and socially, and this preferable image moved humans toward personal and social transformation, toward the creation of a better world in the future. Buddha may have aspired toward the transcendence of time, but he proposed that this was something to be done within our lives – within our future - as a movement to a state of enlightenment beyond where we are now – clearly an image of a preferable future. In general, since the beginnings of recorded history, humans have created ideals and attempted to aspire toward these values and ethical principles; in the West, ideals have been coupled with theories of time and natural progress – that we are part of a progressive reality and that we should jump on board this directional process and participate in its realization. Throughout our history, we have been beings who articulate ideals to be realized in a preferable future; we have, since the beginnings, embraced some version of purposeful evolution. This is an essential feature of our self-reflective, goal directed psychology.[23]

The earliest images of natural and cosmic change and the earliest articulated human ideals can be found in ancient myth and religions. Metaphysical schemes were frequently created to support our ethical ideals; for example, we should aspire toward the good because it is part of God's plan. Yet we also find, especially as we move into modern times, that visions of secular progress and secular ideals emerged, defining the preferable direction to time and our individual lives in terms of such values as economic well-being, individual freedom and rights, and the advancement of knowledge and technology – increasingly associated with scientific progress. Progress, realized through personal and collective effort, occurred at both the social level and the individual level. Theorists, such as Adam Smith, Herbert Spencer, and Karl Marx, connected human progress (defined relative to human ideals) with some type of

principle of natural progress. With the advent of Darwin, the concept of biological evolution took center stage, especially in the West; evolution provided a model and description of natural change, and the ideas of Darwin were quickly appropriated by social thinkers as a foundation for envisioning how to direct social evolution and even the evolution of individual humans. Darwin clearly believed that natural evolution was connected with progress – that it "improved" the nature of life – and he believed that humans, riding on this evolutionary wave, were moving in a progressive direction.[24]

In the twentieth century, there have been numerous critics and skeptics regarding the ideas of progress and evolution. Perhaps the West is in decline; perhaps humanity is in decline; perhaps evolution and progress are biases in the Western perspective – this is the Postmodern critique.[25]

Yet, numerous ideals of the future and visions of preferable futures – inspired by economic, political, social, religious, humanistic, scientific, technological, and philosophical concepts and theories - continue to be created and supported. These ideals and visions to different degrees influence individual and social behavior, impacting how we direct our lives and move forward in the future. We continue to engage in purposeful evolution. In so far as ideas move the course of events in human affairs, and especially normative ideals (values) that describe preferred states of human existence, this ecology of ideas in which we live our lives sets directions for the future. Because there are various visions – describing both our past as well as prescribing our future – there is competition between preferred pathways or journeys to take. One could describe this mental sphere of theories of change and preferred directions as evolution having become self-conscious of itself at a social level and existing as a plurality of voices in evolutionary competition; as humans we reflect upon and debate with each other where we have been, where we are, and where we seem to be going, creating different preferred directions intended to inspire and motivate us into action.[26]

As a general prediction for the future, we should continue to see a pluralistic**,** and simultaneously both competitive and collaborative array of ideal visions (and critiques and counter-critiques), themselves in a state of evolution, motivating and guiding us toward the future. This is the ongoing evolutionary ecology of human ideals and values in which self-conscious humans are embedded; it is our historical heritage, our social-psychological underpinnings running back thousands of years. It is highly doubtful whether any singular "species" of ideals will come to dominate – evolution operates in a pluralistic arena. Hence, in so far as our ideals move us and mold us, our psychological evolution will undoubtedly be pluralistic; one would expect multiple trajectories in the evolution of the human mind.

The Evolution of Psychology

Another significant trend, since the earliest times of recorded human history, is the continued and evolving efforts of humans to understand themselves – to delve into human nature, the self and the mind, and attempt to

gain knowledge of our psychological make-up. Through history such efforts can be found in religion, literature, philosophy, social thinking, science, and within the last couple of hundred years, in the emerging discipline of psychology. One could describe such efforts as the growth of systematic self-awareness and self-consciousness. Yet right from the earliest efforts to understand the human mind, there was the associated goal of attempting to describe what would be ideal or preferable states of the human mind. What is mental health? What is happiness? What is enlightenment and self-fulfillment? What is heightened consciousness and intelligence? And what is the good life as it pertains to human psychology and how do we realize it? Fact and value within the discipline of psychology (and before that in religion and philosophy) have been coupled together. A big part of the future of human psychology will be the continued growth of the discipline of psychology – of enhanced scientific self-awareness – and continued efforts to apply this evolving knowledge to self-understanding (self-enlightenment) and the improvement and purposeful evolution of humans.[27]

Beginning with Freud, Jung, and Adler in the twentieth century, psychological theories emerged which described the essential components of the human personality and articulated ideal mental states and progressive directions for humans. Popular culture assimilated and embraced these different psychologies; the application of psychology to heightened self-awareness and self-improvement became a big area of interest and concern in the general population in the twentieth century. By the 1960s, self-actualization and human potential psychologies, through the work of Carl Rogers, Abraham Maslow, and Rollo May, blossomed, creating new ideal images of psychological health and growth, presumably based upon an enhanced factual understanding of human psychology and a philosophical understanding of the human condition. Mental health and mental ideals included enhanced self-awareness, enhanced self-expression, the transcendence of fear and anxiety, improved psychological balance and integration, increased mental fluidity, ebullience and elation over depression and despair, and heightened human freedom and authenticity.[28]

Within the last couple of decades a new wave of progressive psychologies has emerged. Positive psychology, in an effort to be even more empirically based than self-actualization psychology, and reacting against negative images of human psychology spawned off of the study of mental illness and mental dysfunction, has been experimentally studying the various psychological strengths in humans, such as optimism, self-efficacy, positive emotions, flow, hope, wisdom, and in general those traits that support mental health, happiness, and creativity. The empirical results of this ongoing work have been applied to helping people improve the psychological quality of their lives. As a general point, positive psychology provides a cluster of preferred directions for the future of the human mind and self – a cluster that we should aspire toward. Mihalyi Csikszentmihalyi has described an ideal self – an “evolving self” – for the new Millennium; Martin Seligman has identified the key character traits that support human happiness; and Maureen O’Hara has presented a prescriptive vision of the human mind that integrates and balances integrity and stability with flexibility and growth**,** both pairs of qualities being essential to thrive in the future. (The

flourishing self of the future is a *Yin-Yang*.) The main thrust of all of these approaches is that the positive psychological strengths of humans can be empirically understood and this knowledge can be applied – as vehicles for self-conscious change - to improving or evolving human psychology. Positive psychology attempts to understand what is best in us and how to realize it.[29]

Outside of the positive psychology movement, there are other contemporary psychologies that present descriptive or factual schemes on the nature of the mind and prescriptions regarding how to improve or evolve the human psyche. Behaviorist, cognitive, existential, and social-cognitive views all present theoretical schemes explaining human psychology.[30] Also, there is the historical-developmental framework of spiral dynamics that integrates modes of thinking, value systems, and social organizations and lays out a hypothesized series of stages that the human mind has progressed through since prehistoric times, predicting further stages into the future; it is clear though that the predicted further stages have a prescriptive quality and are seen as more advanced levels of psychological functioning as well as being more adaptive to the challenges and dynamics of the future.[31] Integral psychology, which has had a significant impact on popular culture and popular psychology, attempts to integrate the objective and subjective, the logical and the mystical, and East and West into a holistic vision of consciousness and human nature. It points toward a mode of consciousness more evolved and expansive in the future.[32] Walter Anderson predicts an increasing flexibility, fluidity, and pluralistic complexity in the human self in the future, if not an all-out transcendence of our identification with a personal ego. For Anderson, the self is a social construction; he foresees a new enlightenment where the self-centeredness of humans (especially Western humans) is transcended.[33] As one final example, the evolutionary biologist John Stewart argues that the human mind – following an existing historical trajectory – will need to increasingly identify with the evolutionary process and expand its temporal consciousness away from the immediate here and now. The self will become increasingly future conscious.[34] Many of these approaches foresee both an expansion of consciousness and a more creative, fluid, multi-dimensional self as key elements in our future psychological evolution.

Psychological theories are in evolution, which include theories of mental health and mental dysfunction; what we view as sane and insane has changed through the ages and this historical trend will probably continue into the foreseeable future. Such theories derive many of their ideas through observing human psychology, experimentally and informally. Yet such theories present prescriptions which impact back on the general population, creating changes in human psychology**;** for example the theories of Freud and Maslow changed the psychology of people who became knowledgeable of their theories. Hence, a feedback loop exists and has existed for countless centuries between theories and prescriptions of the human mind and the general psychology of the human population. The sciences and philosophies of human nature are in reciprocal evolution with human nature. In some ways, at least, madness and mental health will mean something different in times to come than today.

Psychological approaches to the human mind and self assume that through psychological means humans can transform themselves. If we understand how our minds work, there are ways to change the process, through the use of our minds. We can intentionally change our behavior, change our thoughts, change our emotions, change our attitudes, and change states of consciousness. This is a philosophy and a form of self-empowerment centered on the potential capacities of the human mind to alter itself. All forms of psychotherapy are based on this idea, as are all forms of meditation and mental and behavioral training. As Csikszentmihalyi notes, at present, we possess marginal, if not poor, self-control capacities; we struggle with maintaining order, direction, and positive emotional states in our own minds.[35] A preferable direction for the future, based on the evolution of the discipline of psychology, would be to gain greater control over what goes on in our own heads.

The brain physiologist Antonio Damasio describes the verbalized sense of self-identity as a self-narrative – a story we tell ourselves regarding who we are – a story of the main events and dramatic occurrences in our life and the character we have shown in dealing with these events.[36] In essence, our sense of self is in evolution throughout our lives, as we add to and re-write our life script based on new experiences and new interpretations. This "auto-biographical self" contains elements both of unity (integration) and diversity (plurality), and clarity and ambiguity. One can imagine the ongoing historical evolution of human psychology in a similar fashion. Across time we have been constructing and re-constructing the story of who we are – of the nature of human nature. There are different interpretations and various questions that we find perpetually perplexing about ourselves. As new theories arise, new ideas are incorporated into the life story (or stories) of humanity. Not only will the story/stories of humanity change and evolve, but the values will evolve as well. As our human ideals evolve, our preferred sense of direction into the future will also change."

The Ecology of Mind

For things are things because of mind,
as mind is mind because of things.

Hsin Hsin Ming

The ecological perspective on human psychology asserts that our minds and our basic psychology are interdependent with the environment. The behaviors and mental capacities we possess exist in resonance with the world surrounding us. The lives we lead are contingent upon the affordances and resources provided by the environment plus those additional affordances and resources we have created or evolved through our inventiveness and our technologies. Adaptation is both passive and active, utilizing what is available in the environment and modifying (evolving) the environment to better fit our intentions and needs.[37] If drastic or fundamental changes occur in the

environment, our behavior and our thinking needs to accommodate to these changes or find some way to modify the environmental changes. As others have suggested, human psychology has probably changed as a consequence of urbanization and civilization; our minds are different now than they were ten thousand years ago prior to this fundamental change in our environment.[38]

Now it is noteworthy that in contemporary times, humanity is being pushed into having to increasingly acknowledge our interdependency with our environment, especially to what is usually referred to as our "natural" environment. As a species we are moving toward a higher level of ecological consciousness, as we increasingly realize the impact we are having on our world and that this impact has the potential to adversely affect the quality of our lives. Instead of seeing ourselves as separate autonomous beings, or as standing above nature as a unique species (a form of dualism), we are coming to a deeper realization of our ecological identity. I can foresee this mental shift in our sense of self-identity continuing into the future as we move into a different type of relationship with the environment.[39]

We are, in fact, ecological beings, and perhaps many of our ancestors realized this better than modernized**,** urbanized**,** individualist humans. But still, it is the insight – the discovery of the fact – that is a critical factor in how we will change psychologically. Throughout history, humans have experienced other deep insights or discoveries, such as the Copernican Revolution, that have altered our psychology. In so far as we behave and think in terms of belief systems regarding the nature of reality, we psychologically change as our fundamental belief systems about reality change. Our ideas about the world impact our identity. (Within a Gibsonian framework, this follows from the ecological nature of our consciousness; we understand who we are in relationship to the world and vice versa.) To believe the world is populated by spirits, demons, and deities clearly created a different type of human mind than our present belief system that the world is moved through natural, technological, and social forces.

The ecological perspective on life and mind is part of a more general mindset – the holistic mindset – that highlights how the various elements and dimensions of nature are integrated and interdependent; it is to look at relationships and the whole (as least as much as the parts). The holistic view of reality**,** – though clearly having a long history in human thought, is becoming a central theme not only in science but in diverse other areas in philosophical, spiritual, and humanistic inquiry.[40]

But it is important to appreciate that reality and, in particular, human nature is a *Yin-Yang*; we are all part of the whole, but equally we are individuals, each of us realizing some level of distinctiveness and uniqueness. Stock, for one, in his "Metaman" theory, realizes that as a technologically networked global social system evolves in the world, individuals will become more empowered, not less. Individuality will flourish to heights beyond what we see today. History is a dialectic of integrative and self-assertive processes – of the one and the many – of unity and diversity – each pole of the continuum provoking the other into further evolution. Though it may sound paradoxical, we presently live in an era

where, relative to the past, there is more control and regulation and more individuality and freedom simultaneously. Our psychological evolution in the future will involve both a greater sense of connectedness and the whole, and a greater sense of individuality.

Psycho-Social Evolution

Human society is part of the ecological context of mind. We exist embedded in a relatively organized plurality of other human beings, and various social structures, organizations, and processes affect individual thinking and behavior. As society changes, individuals change as well. One should, though, imagine this as another reciprocal loop; society (or others) affects individual psychology, but individuals in turn influence their social environment. In considering the future of human psychology, one needs to consider how society might evolve, for the individual and society are tied together.

Throughout history there has been ongoing social evolution and corresponding individual evolution. As a couple of noteworthy examples, the social reality of marriage has changed from tribal and family arrangements for purposes of financial gain and social stability to relatively freely chosen bonding based on personal love and commitment. This social change occurred concomitant with a rise of individual responsibility and an increasing sense of self-determination.[41] Human psychology has also changed as the relative social power structure and status of women and men has transformed in contemporary society. Even if we assume that there are statistical genetic differences between women and men, there has clearly been a shift overall in how men conceptualize themselves and how women conceptualize themselves as male-female equality spreads throughout human cultures.[42] It is interesting to note, though, that it was individuals (most notably individual women) who instigated and provoked the social changes and values which then impacted back on the individual minds and personalities of countless women and men.

What are some of the most important social processes occurring in contemporary times that will affect human psychology in the future, that, in fact, are undoubtedly already affecting human psychology? The process of globalization is interestingly having contradictory psychological effects: It is creating more of a sense of unity and togetherness among many individuals with less of a sense of "us" versus "them," but also, in so far as it is perceived as a homogenizing social process controlled by the modernized West, it is provoking conflict and antagonism in many indigenous peoples.[43] Economic growth, which overall is raising the standard of living for more people, – could shift the central values of many more people toward self-expression and secularism, but in so far as economic growth is creating a more pronounced divide between the "haves" and "have nots," it could create a greater division in human values.[44] The acceleration of modern human life – the social tempo of things – could be creating a more darting, fleeting, anxiety-driven human psyche, one less calm and less long-term focused than in the past.[45] Commercialism, consumerism, and commodification within modernized life could be creating a mentality that sees

goals, self-fulfillment, and human happiness as things to be realized through economic success or security rather than through effort, practice, and persistence. More of us may believe that happiness (or anything else) can be bought.[46] Finally, the spread of relativism and the discrediting of universal values and schemes of thought could generate increasing nihilism, aimlessness, and a diffusion of ego strength in individuals.[47]

Csikszentmihalyi, resonating with Stewart's and Hubbard's views, has argued that the self of the future should more strongly identify with evolution (life is progressive change rather than stasis). The future self should also identify with ecological holism (we are all connected together and connected with nature, rather than being distinct individuals). Both of these transformations would involve an expansion of consciousness – away from the present and away from self-centeredness.[48]

The holistic mindset (introduced in the last section) is, in fact, a general psychological disposition within the Eastern mind, according to the cultural psychologist Richard Nisbett.[49] As Nisbett reports, there are certain general differences in individual psychology, social organization, and basic values that show up in comparing Eastern and Western thinking. If, as a species, we move toward global integration in the true sense of representing and synthesizing the diverse modes of behavior and values across the globe, one would expect a synthesis of Eastern and Western thinking and values occurring in individual minds across the globe. Our unique psychologies will come together into more complex wholes within each of our minds. Part of this would be a synthesis of the "either-or" logic of the West with the "both-and" logic of the East.[50] This is a prime example of the principle of reciprocity at work in the future evolution of the human mind; a synthesis of dualism and monism – of the many and the one. Interestingly, a synthesis of these two modes of understanding and logic would roughly correspond to a similar synthesis, concurrently occurring across many parts of the world, between "feminine" and "masculine" logics.[51]

There is also the general social-psychological prediction that humanity is evolving into a global mind within which individual minds are becoming more integrated; perhaps some type of collective consciousness will emerge out of this. At the very least, minds may organize much more closely together and various new and more empowered collective mental capacities may emerge in the future. The global integration of minds, it is suggested, will be facilitated**,** indeed already is being facilitated**,** by technological interconnectivity – mass communication, the mass media, multi-media communication, computer networks and computer software, and the Internet/World Wide Web. Eventually virtual reality will be another significant technological factor bringing people and bringing minds together. The evolution of a technologically enhanced social organization would undoubtedly transform individual human psychology; it seems that even in the present enhanced technological connectivity is affecting individual human psychology; for example, the capacity and inclination for solitary time seems to be diminishing for those "addicted" to their communication gadgets.[52]

Returning, though, to the individuality-versus-holistic theme, the global mind or mentality which is evolving will not be a system that washes out individuality or eliminates conflict and competition. The ideal social system could be defined as a system that allows for the greatest flourishing of individuality in its members while the ideal individual could be defined as someone who contributes maximally to the social whole; our social and spiritual-philosophical histories are ongoing sagas of trying to realize these complementary ideals. As the historian, Robert Nisbet, notes, at least in the West, models of progress tend to go in two basic directions – advocating for increasing social order and control and advocating for increasing freedom and individuality.[53] This is the dialectic of history – the *Yin-Yang* of the one and the many. We will continue to struggle in our efforts to realize the ideal on both ends of the continuum.

Human-Technological Evolution

How will the evolution of various technologies affect human psychological evolution? First we should consider the basic facts that we are "natural born cyborgs" and that our technologies are both extensions of our bodies and minds and enhancements or modifications of the environment.[54] We can view technologies as detachable body parts – a significant evolutionary advancement over being locked into certain anatomical structures and associated capacities. This fluidity and flexibility in our somatic reality goes back to our beginnings and is one of the distinguishing qualities of our species. Technologies become part of us and we live in a technologically constructed reality. Our biological cores are interdependent with our technological skins and shells. We are naked and helpless – unformed so to speak – without technology. Technology, in fact, is one of the most dramatic demonstrations of our ecological nature; our bodies and minds have been interwoven together in highly complex arrangements with a technologically enhanced environment. (We should note that the natural-artificial distinction is a false dichotomy; – technology is an evolutionary creation of nature.) Hence, it seems that as a general direction for the future, we should anticipate the continuation, if not further evolution, of this techno-bio mode of existence.

It should also be noted at the onset that we will use technology not only to correct psychological dysfunctions or deficiencies but to introduce design improvements in ourselves as well. We will not simply fix what is wrong; we will attempt to improve upon what is now considered normal or acceptable.[55] This stands to reason, since humans not only try to fix problems, but also strive toward increasing excellence. Further, as noted earlier, our values and standards will undoubtedly evolve in the future and, consequently, what we might find acceptable today will probably be seen as impaired or deficient in the future. Through advancing technologies, we will engage in purposeful evolution with more power than ever before.

Our evolving understanding of the body, and especially the nervous system and the brain, will provide a foundation for technological enhancements

and biological modifications that will transform human psychology. It is conceivable that we can redesign the brain, perhaps in multiple different directions, using values and theories of optimal mental functioning and states of being to guide us in re-engineering ourselves.

At the genetic level, human psychology could be modified through both somatic gene therapy and germline gene therapy, although probably many identifiable psychological traits or capacities are polygenic (influenced by many genes as opposed to one). Psychological and genetic research indicates that there are very strong genetic components to many psychological abilities and dispositions; consequently we could alter (presumably in a preferable direction) a person's intellectual, emotional, and behavioral dispositions through modifying, either at birth or later in life, his or her genetic make-up.[56]

As our biochemical and psychopharmacological knowledge continues to improve, we can introduce changes in the chemistry of a person's body, and especially a person's brain, that would facilitate desired psychological changes. We already do this; in fact throughout our history we have attempted to alter our psychological states and dispositions through the ingestion of chemicals, natural and artificial.

Genetic engineering can be combined with psychopharmacology, and this same principle of utilizing multiple technologies in our ongoing purposeful evolution holds true as we introduce other forms of technology into the picture as well. One would imagine that we will combine and integrate multiple technological enhancements in our future evolution. Nanotechnology, either alone or together with genetic and pharmacological enhancements, can be used to augment brain or nervous systems functions. Computer implants or interfaces with the brain promise to enhance perceptual and cognitive processing and memory functions; emotional and motivational processes will also be impacted as well.

Ray Kurzweil believes that it is computer technology that promises the most powerful technological enhancements of the human mind; in fact, ultimately it may be possible to download the entire psychological make-up of an individual (as embodied and coded in the person's brain) into a computer system. If this is indeed realized, the capacities of the human mind will only be limited by the processing capacities of the computer systems used. Further, at this point a mind or self could exist entirely "inside" of a virtual reality created in the computer system (perhaps by the person); the body experienced would be controlled as well by the individual. Also, as Kurzweil notes, a person could "materialize" in a nano-technologically constructed body in the physical world, in essence, being able to move back and forth between virtual and physical realities and realizing whatever bodily forms the person wished.[57]

Ecologically, to alter not only the basic parameters of the environment but also the type of body that interacts with that environment would fundamentally change the human psyche. Imagine a person who possessed the capacity to fly, through either changes in body or environment or both, or who could move through objects at will**.** Such alternative modes of locomotion and action will transform the sense of self and one's relationship with the world; humans who fly

will not think like us. Humans who can change the forms of their bodies will have a different sense of self.

Our mode of interacting and interfacing with machines and tools is in evolution. Specifically, increasingly complex design features are incorporated into machines which reflect the goals and modes of thinking and behavior of humans. Reciprocally, we acquire new skills and strategies for interacting with the world. As machines become more intelligent and more cognizant of the user through, for example, the evolution of software "agents," they will increasingly feel like and act as extensions of our selves, or, at least, as partners; our self-identity will extend further out into our machines; we will realize, increasingly so, distributed bodies and distributed minds.[58] Without being "mad," we will routinely have conversations with ourselves.

As one final note in this section, since advances in science inform and frequently direct advances in technology, one would imagine that as our understanding of deeper and more fundamental levels of natural reality grows through science, new kinds of technologies – more subtle and powerful technologies – will emerge that will be harnessed by the human mind. Penetrating down to the universal fabric of time, space, and energy may allow us to create technologies that will support mental capacities such as telepathy, psycho-kinesis, the mental creation of physical realities, and even forms of space and time travel (through our minds). It may be that we are only at "the dawn before the awakening."

Cosmic Consciousness and the Cosmology of Consciousness

One of the great philosophical and scientific puzzles throughout history is the nature of consciousness and its connection to the physical world.[59] In this final section I will examine the future evolution of consciousness, considered from three different points of view: Space exploration and colonization, spiritual enlightenment, and the pursuit and development of wisdom. Identifying the evolution of cosmic consciousness as the central trajectory for the future of the human mind, I will draw from all three perspectives to explain this concluding thesis. Further, I will connect the idea of cosmic consciousness with a number of fundamental themes, such as ecology, reciprocity, and purposeful evolution, discussed in this paper.

Assuming that humans journey out into space, and colonize different planets, moons, or other habitable environments, it is highly probable that both our physical and psychological make-up (and supporting technologies) will be transformed in adapting to the varied strange and alien conditions in outer space. At one scale of transformation, something as simple as the colonization of Mars (as described in Kim Stanley Robinson's *Mars* trilogy) will probably instigate a variety of noticeable changes in our biology, psychology, social structures, and values, although basically we will still remain human or human-like.[60] As discussed in Marshall Savage's *The Millennial Project*, the settlement of the asteroid and Kuiper belts – densely populated rings of rocks and chunks of ice – will provoke increasingly significant physical and mental changes.[61] At this point

we may diverge into multiple species. Even more dramatic evolutionary changes will probably occur for human descendents that abandon any type of terrestrial anchor and became truly creatures of space – fundamentally aerial in nature; this possibility is examined in Dan Simmons' *Hyperion* series.[62]

Humans or human descendents could become "locally" adapted to various specific conditions in outer space, but once we move outward into space and begin to spread through first the solar system and then the galaxy, we will have fundamentally expanded and transformed our living environment; we will progressively realize a cosmic form of being rather than a local or terrestrial mode of existence. Our environment will be space – sprinkled generously with varied "islands" to touch down upon and visit, as well as artificially constructed astral technologies, including "highways" linking our astronomical islands together. (For example, "wormhole" pathways as in *Contact*, but also to be found as "farcasters" in Simmons' *Hyperion*. We will probably also create galactic "Internets" as in Vernor Vinge's *A Fire Upon the Deep*.[63])

One could say that we will realize an evolving form of cosmic consciousness; the whole that we see ourselves within and connect our identities to will no longer be simply the earth, but will expand to include the solar system and eventually the Milky Way and beyond. To follow the speculations of individuals like Savage and the cosmologist Frank Tipler, in the far distant future we will colonize the entire universe; the whole in which we exist – in which we travel, communicate, and live our lives - will extend for billions of light years in every direction.[64] Of course, beings who call the universe (or even the galaxy) their home will probably have life-spans and levels of cognitive intelligence far beyond anything that presently exists in humans.

Extrapolating on the idea of a global mind emerging on the earth, it is quite possible that the "noosphere" of the earth – the global mind and consciousness of future humanity – could progressively spread outward through space, enveloping in mentality and intelligence the physical universe. Kurzweil suggests such a possibility, and Tipler goes so far as to propose that in the far distant future a cosmic mind will emerge, permeating the entire universe and gaining mental control over the total cosmos. In essence, the ultimate future evolution of mind and consciousness, in Tipler's scenario, is God – an omniscient, omnipotent mind integrating and controlling everything that exists in the universe. Kurzweil's image is not very different, though it may seem so on the surface. Kurzweil's evolution of cosmic consciousness will be realized through the ongoing evolution of the technologies of space exploration and artificial intelligence; it will be cyborgs, robots, nano-colonies, or something of this nature that will realize this expansive mental state.

As Kurzweil and others note, the universe can be described as an information processing mechanism and evolution can be seen as the acceleration of more powerful and efficient forms of information processing within the universe. Further, intelligence can simply be seen as the capacity for processing information.[65] Hence, as minds evolve and expand through the universe, bringing with them advancing forms of technology, such minds will enrich and empower surrounding environments. The universe as a totality will

increase in intelligence. Cosmic consciousness will evolve in a universe that will become increasingly intelligent in the process.

From an ecological perspective on the mind, the psychological and evolutionary significance of moving into outer space is that cosmic consciousness can only be truly realized by venturing into the universe and making it our living environment. Our minds will expand commensurate with the reality in which we live. Further, the evolution of mind and consciousness throughout the history of life on earth has progressively moved in the direction of greater conscious expanses of space and time; minds evolve from the local and immediate to the global and into the past and the future.[66] Moving into outer space and expanding our minds further in space and time is just a natural continuation of this long-standing process.

But once again, the holistic vision of reality needs to be balanced and tempered by the individualist perspective when we consider future psychological evolution. If our sense of the whole in which we are embedded evolves to encompass the entire cosmos, then following a reciprocal logic, the individual minds which populate this future reality will realize a level of individuality and uniqueness commensurate with this cosmic awareness. The *Atman* within individual humans will rise to the level of cosmic ambience, reflecting it. Future human selves will be more dramatic, poignant, and colorful relative to present human personalities, as present human personalities are relative to the personalities of bacteria. Individuality is not going away; it will amplify in the evolution of cosmic consciousness.

Turning to religion and spirituality[67], throughout history these traditions have aspired toward knowledge of God, conscious resonance or mystical union with the cosmos, and an understanding of how humans connect with the grand scheme of things. Religious and spiritual traditions also aspire to gain knowledge and guidance regarding how to live an enlightened and moral life in accordance with God or in accordance with the deep principles of nature and the universe. Cosmic consciousness is connected with ethics. Some religious traditions, such as Hinduism, aspire toward finding God within – the divine spark of *Atman* – which would illuminate a person's true inner nature as well as his or her perception of reality. Also, heightened spirituality can lead to a sense of oneness with existence – a transcendence of the boundary between the self and the world. In essence, religion and spirituality attempt to connect the individual with the cosmic whole, illuminating both, and attempt to find ethical guidance in this heightened consciousness as well. This is an idealistic vision of human existence and human consciousness, providing a general sense of direction for humanity. It points toward an ideal future, both individually and collectively. This ideal direction is the realization of cosmic consciousness, illuminating both self awareness and understanding, and providing cosmically informed ethical direction for human life.

Over the last few centuries, there has been significant tension between religious traditions and science, specifically regarding which approach provides an accurate depiction of reality and which provides a more valid avenue for gaining knowledge. Yet, both approaches aspire toward the ultimate goal of a

deep and comprehensive understanding of the universe; both are in search of cosmic consciousness. Though they approach reality along different paths, both science and religion/spirituality also search for inner understanding and knowledge of the self, of consciousness, and the mind. Science approaches the mind through the discipline of psychology; spirituality approaches the mind through meditation, prayer, intuition, revelation, and mystical insight. Still the search for inner and outer understanding and the connection between the two is something science and religion share in common.[68] Both promote "ecological understanding" of the nature of mind in relationship with the nature of the universe.

Where religion and science differ is that the former is concerned with ethics and values and the latter presumably deals only with factual knowledge. Whereas religion points toward a more ethically advanced future human, science points toward enhanced understanding and knowledge of humanity and reality. Yet, as I pointed out earlier, the discipline of psychology frequently goes beyond simply understanding the human mind, providing guidance and direction for improving psychological well-being. And furthermore, any viable ethical system must incorporate an understanding of the "nature of things" which is something that science attempts to provide.

Many have argued, including Ken Wilber as one noteworthy example, that the religious-spiritual and scientific perspectives on humanity, life, and the cosmos must find a way to integrate into a more holistic and complete vision.[69] For Wilber and others, both approaches are needed to guide our future evolution.

Turning to the related themes of wisdom and enlightenment, it has been proposed by various writers, such as Walter Truett Anderson and Rick Smyre, that in order to constructively and positively address the numerous challenges and problems facing humanity today, a "new" or "second enlightenment" is needed. This new enlightenment should be a global and collective reality, involving humanity as a whole. As a species – as a global society – we need to evolve; in fact, we are being provoked into a psycho-social evolution in order to rise to the challenges of our times. Anderson and Smyre identify various features of this new enlightened state of mind, and in particular, highlight the themes of holism/connectivity and dynamism/evolution, themes similar to what Csikszentmihalyi identifies as key qualities in the future "evolving self." We need to more thoroughly and deeply embrace the principles of change and interconnectivity. I have suggested that the development of wisdom, as a pivotal character trait or virtue, should serve as the center of gravity of this emerging new enlightenment. Wisdom, based on contemporary psychological research and philosophical examination, is a dynamic and holistic mode of human understanding. In particular, wisdom, as I have argued, is the highest expression of future consciousness – the realization of expansive temporal consciousness integrating past and future in both understanding and ethical action. Part of the new enlightenment needs to involve a heightened sense of future consciousness, integrating the past and infused with ethical considerations.[70]

Wisdom has become an active area of philosophical and scientific study in recent times; positive psychology, especially, has contributed to a renewed

interest and increased understanding of this human capacity.[71] Wisdom can be understood as a preferable and positive trajectory for the future evolution of the human mind; historically it is frequently identified as the highest of human virtues. Bringing wisdom (along with enlightenment) into the discussion on the future of human psychology highlights the important theme of ethical development. If we are considering the preferable future direction for human psychology, we need to go beyond cognitive-intellectual developments and even personal-emotional advancements; we need to consider how humans can progress ethically or morally as well. As noted earlier, we are beings engaged in purposeful evolution, and consequently it is imperative that in considering how we want to evolve ourselves, we include those virtues, values, and ethical qualities that will truly make for a "better human being."

The virtue of wisdom suggests itself as an appropriate ideal and central guiding light in our purposeful evolution and self-development. Wisdom is an evolutionary-transformative state (it is the nature of wisdom to keep growing); it is a mode of expanding and expansive consciousness; it is integrative and holistic (ideally it is global and cosmic in perspective); it is an ethical mode of consciousness embodying standards of excellence; it stimulates the growth of mental health and well-being; and it is a pragmatic mode of consciousness, synthesizing the intellect with heart (compassion) and practicality. On the last point, clearly our psychological evolution will be (and should be) propelled by realizing practical and ethical solutions to problems and challenges pertaining to our environment, our society, and our world; psychological evolution is ecologically motivated.

The pursuit of wisdom is a long-standing goal of the great religious and spiritual traditions. Wisdom comes through enlightenment, through getting in resonance with God, and through identifying the correct ethical or moral path in life. But whether one is secular or religious in one's thinking, there is clearly a conceptual overlap in understanding wisdom as cosmic or expansive in scope, ethical and practical in nature, and critical to the overall character development of the individual. Wisdom defines a holistic ideal for the evolution of the human mind, human character, and human behavior, synthesizing the cosmic, the personal, and the ethical.

Yet wisdom is, as noted above, a transformative reality; it is not something one realizes once and for all, either collectively or individually. Wisdom evolves. And if we apply contemporary evolutionary theory to the future of wisdom and humanity then one would expect the growth of the human mind and wisdom to be tumultuous, difficult, and unsettling at times; there will be order and chaos (or as religious traditions point out, both good and evil) along the way. The growth of wisdom is a hard-fought struggle. Hegel's mistake, which is similar in nature to the mistake made by most religious traditions as well, is in believing that there is paradise at the end of the road – a realization of the absolute – an attainment of true and complete enlightenment. Following a *Yin-Yang* logic of evolution instead, the human mind grows through struggle and challenge – through ebb and flow – through order and chaos. Wisdom remains alive in the fire of life. The bumpy

road of psychological and ethical evolution, epitomized in the pursuit of wisdom, will be never-ending.

Returning to Gibson's ecological psychology, but expanding upon his basic idea of reciprocity, in conclusion, I would propose that mind and consciousness arise in the context of the universe as a whole – first dimly at a local and elementary level and ever more brilliantly as awareness expands to take in more of the cosmos. The seventeenth-century philosopher Gottfried Wilhelm Leibnitz argued that the individual units of reality were "monads," with each monad possessing a unique perspective on the universe. Within this model, each individual conscious mind can be seen as a perspective on the whole, realized in the context of the whole.[72] Just as advocates of the Gaia hypothesis argue that we are the earth becoming self-conscious, I would suggest that we are ultimately the universe becoming self-conscious.[73] Of course, there may be other intelligent minds spread throughout the cosmos and such minds may also participate in this process of evolving self-consciousness. This ongoing journey will simultaneously bring greater illumination to both inner understanding and the cosmic ambience – realizing a consciousness that is ecological in nature.

This emerging cosmic consciousness will also be evolutionary, in fact, self-consciously evolutionary. Values and preferred directions for the future will be articulated, pursued, and utilized to inform and guide the ongoing dynamical process. The evolution of cosmic consciousness will be purposeful.

In essence, the future of human psychology will pivot on our thoughtful and ethical participation in the universe becoming increasingly self-conscious and self-directive.

In some deep sense, consciousness is the mind of the universe awakening.

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