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COMMENTARY

Bonding, Biophilia, Biosynergy, and the Future of Primates in the Wild

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Human and nonhuman primates bond with one another in countless ways, and the results are varied and vital to the individuals and species involved. The manifesto that is the basis for the collection of essays in which this commentary is included proposes that the ''human/nonhuman bonds that arise in primatological research and practice deserve and demand study and research.'' An essential corollary of this proposal is that the primatologists themselves must be studied. The aim of this essay is to explore the influence of human/nonhuman primate bonding on conservation practice and on the future of primates in the wild. This commentary applies the author's professional experience as a conservation psychologist and his research on the impact of profound interspecies bonds on human worldviews, attitudes, and behavior. It examines two general categories of bonds: those driven by Biophilia (human fascination with life) and those influenced by Biosynergy (mutual enrichment of life). It is the author's premise that biosynergy promotes complex collaborative interspecies bonds that broaden the conservationist's desire to enhance synergy among all organisms in an ecosystem. Conversely, biophilia induces relatively simple unidirectional bonds between humans and other animals that deepen the conservationist's desire to understand and protect certain species. This contrast raises some crucial questions. Do biophilia-driven bonds between conservationists and their favorite primates blind them to the synergistic needs of all species and impair their ability to work for sustained preservation of threatened habitat? Does biosynergy-based human/nature bonding enhance focus on conservation as an ecological science and thus ignore species-specific factors crucial to assure survival of endangered primates? How can both types of bonds be optimally applied to the conservation of wildlife and wilderness? Am. J. Primatol. 73:245–252, 2011.

Key words: interspecies bonds; conservation; biosynergy; biophilia

PRIMATOLOGISTS IN PARADISE

The belief in a harmonic unitary reality inclusive of all living beings has been expressed in the paradise myths of societies throughout human history [Jacoby, 2006]. The characteristics of the state of paradise almost universally include human friendship with the animals and knowledge of their languages [Eliade, 1960]. In Africa, where human and nonhuman primates first evolved, most indigenous cultures have long believed a panoply of paradise myths asserting that people once understood the languages of the animals and lived with other creatures in peace, but through careless acts humans broke their interspecies bonds and lost their place in paradise [Baumann, 1936]. To this day, legends of humanity's break from unity with the animals are found in traditional folktales of native communities. For example, an elder villager of the Cross-Sanaga River region of Cameroon tells of a time when people and gorillas interacted peacefully, with the great apes feeding freely on locally farmed fruit and playing with young children. ''All this friendly relationship was reversed when people started hunting the gorilla for meat. The gorilla since then has been very fearful of humans and vice versa.'' [Ndeloh-Etiendem, 2008a; p 15].

Whether local forest dwellers or expatriate primatologists, people often see tropical rain forests as the last remnants of Eden and mourn their destruction as examples of ''paradise lost'' [e.g. Galdikas, 1998; Goodall & Berman, 2000]. It has been suggested that the drive to explore pristine wilderness and to bond with wild animals reflects our desire to experience paradise as our human ancestors knew it, before they ''fell from grace'' [Lorenz, 1952].

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Unfortunately, the human invasion of tropical wilderness—whether to study, safeguard, exploit, or be inspired by it—puts paradise at risk. Much has been written about the ecological ''footprint'' of primatologists and other human interlopers on wild primates and their habitats [e.g. Fuentes & Wolfe, 2002; Patterson & Wallis, 2009]. In this essay, we shall consider the psychosocial ''mindprint'' tattooed on the worldviews of primatologists by their experiences with wild primates and wilderness. For better or worse, primatologists have influenced paradise for decades, and paradise has returned the complement.

WORLDVIEWS: SYNERGISTIC COMMUNAL VS. COMPETITIVE HIERARCHICAL

From infancy onward, all living beings perceive and relate to life through an evolving worldview apparatus [*Weltbild-Apparatur*: Lorenz, 1977, p 175; Rose, 1996a]. Anatomy and neurobiology, social structure and dynamics, cultural values, and personal motives and experiences influence various dimensions of each being's worldview. Although it is likely that all sentient beings have a variety of distinctive worldviews, this essay will concentrate on two major worldviews that operate in humans who inhabit and invade African primate habitat where this author has focused his conservation psychology efforts during the past 15 years: the synergistic communal worldview and the competitive hierarchical worldview.

The B'aka people of the Dja forest in eastern Cameroon, like most indigenous forest dwellers, see themselves as coparticipants in a harmonic living paradise wherein all inhabitants are revered as sacred elements that operate in synergy to make the forest a place of safety, health, and wellbeing. Although the B'aka recognize their similarities to apes and monkeys, they tend to believe that all members of the forest community are invested with powers, responsibilities, and privileges as important to ecosystem wellbeing as those held by themselves and their fellow primates [Melloh-Mindako, 1996; Ndeloh, 2008b, unpublished manuscript]. Most B'aka hold a synergistic communal worldview of forest life.

Descendents of various Bantu tribes that live on the periphery of Cameroon's Dja forest region once respected the forest as a mysterious and often dangerous paradise from which they could gain protection and resources using the B'aka as intermediaries. During generations of influence from colonial cultures, the Bantu worldviews changed to fit those of their European masters. Most colonials viewed the natural world and its remaining parcels of paradise as a resource created by a higher authority for the rule and benefit of humans—especially humans with family heritage, cultural beliefs, and social identity akin to their own. When this author first began observing human life in the Cameroon rain forests [Rose, 1996c, 1998b], most Bantu villagers considered the B'aka as inferior beings whom they exploited in the pursuit of forest resources. Most Bantu and their colonial masters hold a competitive hierarchical worldview.

Outsiders from rural and urban areas who come to primate habitat, and to tropical rainforests worldwide, generally operate through a competitive hierarchical worldview. Natural resource exploiters, wildlife bushmeat sellers, eco-tourist company owners, dam, bridge, and road builders, etc., invade the wilderness to do business, to compete for raw resources or tourist attractions in what they consider an otherwise rather useless part of the earth [Rose et al., 2003]. Hostile nations and tribes make war with one another to gain what they often consider a deserved advantage over lesser human societies in controlling and civilizing the crude earth. Even genuinely beneficent individuals and organizations occasionally become obsessed with the incentive of personal triumph over others: field scientists scuffle to gain control over the best locations to study their favorite endangered species; medical researchers compete to be the first to trace the origins of deadly viruses and to claim rights to the sale of natural cures; conservationists embellish their images as wildlife protectors to gain advantage over their corporate competitors for donor funding. No matter how high-minded our ultimate goals may be, the methods whereby we achieve them can be subverted by the mindprint of the competitive hierarchical worldview.

The majority of persons who are born, raised, and live within tropical rainforests and other natural habitats are usually guided by a synergistic communal worldview. Aboriginal communities, local tribes and nomadic traders, lifelong wilderness explorers and adventurers, and conservationists who make their homes within threatened ecosystems tend to see themselves as communing in synergy with fellow inhabitants in a rare and wonderful part of the earth. Although some people may be informed with self-serving motives, the longer a person lives within the wilderness and considers it home, the more her/his worldview transforms into a communal one through which all life forms are considered kin. Paradoxically, bonds with certain wild animals can distort the communal affinity held by persons who inhabit the wilderness. Field primatologists who have profound relationships with special monkeys or apes can bypass their worldviews and devote their energy to the study and protection of kindred individuals and species with less regard for other wildlife and their habitats.

BONDING AND PRIMATOLOGY

Among all wildlife-related fields, primatology is a vulnerable and verdant field for emersion of the many and often contradictory effects of interspecies bonding. On the one hand, bonding with monkeys and apes is responsible for recruiting millions of lay

people to support the cause of wildlife conservation. The advertising and fundraising value of primate flagship species is tremendous. On the other hand, when people's bonds induce them to value nonhuman primates above other animals because they are kindred species, they reinforce the principle of a human-dominated hierarchy of species and indirectly strengthen support for the belief in human dominion over the earth. In so doing, primatologists' bonds with apes and monkeys may reinforce competitive hierarchical worldviews and become the impetus for even more cases of paradise lost.

If we are to understand the causes, patterns, and impacts of bonding between humans and nonhuman primates, we must expand our research methods and address the motives, aims, and worldviews of the primatologists. No individual scientist or practitioner and no singular discipline can lay claim to objective truth, when one's own attitudes, values, behaviors, and relationships become the objects of study. We can best approach a full understanding of relationships between humans and other animals by collaboratively amalgamating diverse ''convergent subjective perceptions'' of those relationships [Rose, 1996b]. Foremost, we need to investigate the wide and varied expressions and influences of people's most profound interspecies relationships and bonds.

The media is filled with personal examples of interspecies bonds between humans and their animal companions and subjects. The well-known literary stories, such as those of Jane Goodall and David Greybeard [Goodall & Berman, 2000], Dian Fossey and Digit [Fossey, 1984], and Birute Galdikas and Akmad [1998], are being swamped in recent years with internet YouTube videos of lay people and wildlife professionals having profound relationships and reunions with wild animals in natural habitats. Video clips of the recent interaction of Damian Aspinall with Kwibi, a gorilla born and raised at Howletts Wild Animal Park in England and relocated to Project Protection des Gorilles Gabon have been seen by more than a million online viewers [AquaVitaFilms, 2010]. Although the emotional interaction of Damian and Kwibi is an obvious example of a durable bond between man and gorilla, the neurobiological and cognitive/emotional development of the bond are complex phenomena that require extensive study to fully understand. In this case, as in most long-lasting human–great ape bonds, other humans and apes participated as caregivers, cohorts, trainers, friends, and family to the two main members of the bond. Scientific study of the formation, meanings, patterns, and effects of such interrelated bonds must include the viewpoints and experiences of those significant others who interacted with both members of the bond in question.

At the 2009 ASP annual conference, this author helped conduct an interdisciplinary workshop [Erwin et al., 2009] examining the life and development of Michael—a western lowland gorilla whose profound bonds with humans seem to be associated with exceptionally high numbers of a specialized type of brain neuron related to higher order cognitive, emotional, and social functioning [Allman et al., 2010]. Because Michael came to California at age two and participated 25 years in a highly synergistic interspecies communication research project, there are archives of journal entries and reels of video of his remarkable development as a story teller, visual artist, musician, and silverback protector of his large cohort of human, gorilla, and animal friends [Patterson et al., 2009; Rose et al., 2002] Experts and students in language learning, emotional and social behavior, neuroscience, anatomy, evolution, and the fine arts are collaborating to cross-reference and integrate research on key relationships in Michael's life and their contribution to the extraordinary development of his great ape brain, mind, and behavior.

To conduct similar comprehensive research on the effects of bonding between humans and nonhuman primates in the wild is a more difficult challenge, if only because the variables are harder to observe, control, and document. Nonetheless, whether in captive or wild settings, an essential step is to study the human dimensions of the bond: interview, introspection, and behavioral evidence of the human observers/caregivers/conservationists' worldviews and interspecies experiences must be gathered and cross-validated by multiple data analysts representing diverse disciplines and cultures. The primatologists' views regarding the relative values and capacities they attribute to individual animals, diverse species, and different ecosystems is a crucial determinant of the quality, impact, and durability of human/nonhuman primate bonding.

BIOSYNERGY VS. BIOPHILIA

To demonstrate how a person's worldview influences interspecies bonding, this essay will compare and contrast two biopsychosocial mechanisms that affect people's personal and professional interactions with other animals—biophilia and biosynergy. Although both these relational modes produce bonds between humans and nonhumans, their fundamental processes and effects are often very different. In general, the phenomenon of biosynergy is supported by a synergistic communal worldview, whereas the concept of biophilia seems to operate through a competitive hierarchical worldview.

The concept of biophilia, defined by Fromm [1964] as love for humanity and nature, was reformulated by Wilson [1984; p 1] as ''the innate tendency to focus on life and lifelike processes.'' Wilson's formulation of biophilia emerged from his worldview as a naturalist whose fascination with other life forms began as a shy and lonely boy of seven who came across a huge jellyfish floating like

an astonishing work of creation in the shallows of Paradise Beach on the east shore of Florida's Perdido Bay [Wilson, 1994]. It's fitting that the author of the seminal monograph called ''Biophilia'' [Wilson, 1984] initiated his bond to nature in a place called Paradise!

Many decades after his profound encounter with the jellyfish (and scores of other nonmammalian species), Wilson and an eminent group of scientists, philosophers, psychologists, and explorers gathered at Wood's Hole Oceanographic Institute in Massachusetts to discuss his conceptualization of biophilia and produce an important interdisciplinary anthology on humankind's affiliations with other species: ''The Biophilia Hypothesis'' [Kellert & Wilson, 1993]. This volume includes essays on the diverse relationships between people and nature—emotional, aesthetic, cultural, symbolic, evolutionary, ethical, political—and explores the premise that humans are inherently structured to be fascinated by and bonded to other animals. Three years later, in ''The Value of Life'' [Kellert, 1996], scientific studies of diverse people's attitudes toward nature were amalgamated into a typology of primarily biophilia-based human values: Utilitarian, Naturalistic, Ecologistic–Scientific, Aesthetic, Symbolic, Humanistic, Moralistic, Dominionistic, Negativistic. These groundbreaking books have evoked a flood of ideas as to how innate human biophilia could be used to conserve nature for human benefit. In the conclusion to ''The Value of Life,'' Kellert [1996; p 217–218] wraps up his argument for biophilia as a potential boon to humankind:

> The willingness to coexist with the rest of creation should enhance rather than diminish the human condition. Our standing at the pinnacle of the great chain of being may be enlarged rather than lessened by greater appreciating our varied connection with the diversity of life. As Wilson [1984] suggests: The more we know of other forms of life, the more we enjoy and respect ourselves. Humanity is exalted not because we are so far above other living creatures, but because knowing them well elevates the very concept of life.

Biophilia, as conceived and elaborated by its main proponents, is a drive limited solely to humans. From their hierarchical perspective that places humans at the pinnacle of living beings, the innate human drive to know other living creatures becomes a self-serving and self-aggrandizing act. Biophilia's huge potential as a motivator of wildlife and nature conservation is weakened by ignoring the intrinsic value of other life forms and discounting their capacity to value humans, let alone one another. As a guide to understanding interspecies bonds, biophilia's focus on one-way human to nonhuman bonding would benefit by expansion to include multidirectional capacities for the nonhuman species to experience and express processes such as appreciation, fascination, collaboration, generosity, caring, friendship, and love.

The phenomenon of Biosynergy was experienced, studied, and defined by this author [Rose, 1982, 1998a, 2004, 2007, 2009] as a biopsychosocial force that compels organisms to collaborate synergistically with one another for the greater good of all life. Biosynergy focuses on multidirectional cooperative relationships among individuals and collections of species living within shared ecosystems; as such, it is a special case of ''synergism'' which Peter A. Corning describes as a category of functional effects central to the evolution and dynamics of complex systems:

> ''Synergy'' …refers to the interdependent functional effects (the bioeconomic ''payoffs'') of … cooperative phenomena. … synergy is a room without walls in terms of which kinds of cooperative relationships are applicable; combined effects of all kinds and at every level of living systems are relevant, from enzymes to ecosystems; indeed, the term can even accommodate such unconventional but important biological phenomena as animal-tool ''symbioses,'' not to mention the relationships between humans and their technologies. Synergy can also comfortably handle both mutualistic and parasitic effects, as well as various asymmetrical distributions of costs and benefits and even cooperative effects that defy the conventional categories. By focusing on cooperative effects of all kinds, synergy is thus a more pan-disciplinary and inclusive term. [Corning, 2005; p 2]

This author's relatively recent discovery of Corning's monumental examination of synergy at every level of living system, from enzymes to ecosystems to economics [see Corning, 1983, 1996, 1998, 2003, 2005], has encouraged me to expand efforts to promote the investigation, assessment, and application of the principles of biosynergy in primatology. After decades experiencing and studying the interactions between humans and other animals, it has become apparent to this author that biophilia- and biosynergy-induced relationships tend to produce different outcomes. Bonds formed through biosynergy are likely to harmonize human/nonhuman cooperation, and lead to mutual satisfaction of human, nonhuman, and ecosystem needs. Biophilia motivates humans to bond with other animals principally for human satisfaction; this can lead to overlooking or dismissing the broader needs of the nonhuman animals and their ecosystems.

INTERSPECIES EPIPHANIES

This author's studies of profound interspecies events (PIEs) that inspire people to become

professionals in animal-related fields have uncovered patterns that correlate with distinct forms of biophilia and biosynergy [Rose, 1994, 1996b, 2006]. Among primatologists, most human/nonhuman bonds arise out of three types of PIEs that reflect biophilia categories that were defined by Kellert [1996] as ''humanistic, scientific, and naturalistic'' and which correlate with the life stories of animal caregivers, researchers, and conservationists, respectively. Although all three of these bonding experiences propel people into the animal world, the ways those people relate to nature often differs.

The most common bond with other organisms occurs when animals that we consider dangerous, distant, or disinterested befriend us. *Humanistic* interactions with wild creatures that *Seek A Friendly Encounter* with a human produce deeply personal PIEs. These SAFE scenarios are the predominant PIEs reported by people who are not involved in animal work. Persons who work as animal caregivers, zoo keepers, animal trainers, and veterinarians also tend to report having profound friendly encounters with other animals when they were children and young adults. Our research in schools and communities in west and central Africa has shown that sharing stories about PIEs in which wild animals seek friendly encounters with humans engenders proconservation values [Ndeloh-Etiendem, 2008a]. People are more likely to argue for the protection of endangered animals because the animals are friendly toward humans, than because the species is rare and seems to be going extinct [Rose & Fraser, 2006]. On the other hand, humanistic bonds with apes and monkeys often lead to narrow and possessive devotion to specific primates, sometimes at the expense of other animals and ecosystems.

The wildlife scientist's appetite for discovery often emerges from profoundly intriguing interactions with other animals in which the person feels that she/he has uncovered a secret clue to understanding animals and nature. This is the kind of epiphany that *Scientific* investigators seek, in which animals *Exhibit Natural Reactions that Illuminate Crucial Hypotheses* (the ENRICH scenario). Although researchers thrive on the discovery of animal secrets and the testing of hypotheses about the nature of our primate cousins, often their bonds function to produce compliant scientific subjects, rather than thriving apes and monkeys. Lay people around the world, including those who live in primate habitat, are occasionally moved to conserve monkeys and apes when told of scientific discoveries. But the fact that apes share the same DNA, express similar family values, or suffer comparable diseases with humans doesn't necessarily cause people to invest in their protection [Rose et al., 2008]. The scientific bond with other primates typically places advancement of science and scientist ahead of concerns about torture in laboratories, imprisonment in cages, and extermination in the wild. This author's presentations to medical researchers of videographic field observations of bushmeat hunter's butchering primates in the forest, as a likely mechanism for transmitting SIV and other potential pathogens [Rose et al., 1999], stirred much more interest in opportunities to test the blood and fecal matter of hunters and slaughtered apes than in confronting the bushmeat crisis. Similarly, although my profound bond with a laboratory monkey caused me to give up primate brain research more than three decades ago [see Rose, 1998a], countless graduate students have made careers involving invasive and sometimes deadly study of incarcerated apes and monkeys with whom they had become strongly bonded. Although some attention has been paid to the effects of bonding on experimental results in the laboratory [Davis & Balfour, 1992], scientific investigations focused on human/nonhuman bonding in primate field research settings are lacking.

Conservationists often report life-changing PIE's in which they were overwhelmed by the majesty and numinous mystery of the natural world. These awe inspiring *Naturalistic* events, in which a person is *Shown an Extraordinary Element of Nature* (the SEEN scenario), have driven people to explore the far reaches of earth for millennia. Much has been written about the glory of spiritual pilgrims and the valor of wilderness adventurers. People are prone to exalt the courage of conservationists who trek through swamp and savannah searching for ecological evidence and photographic images of endangered species that they can then use to promote the preservation of critical habitat and the protection of biodiversity hotspots. Our bonds with pristine landscapes are often formed through the awe-inspiring experience of biosynergy. Fascination with primeval ecosystems is more likely to lead to holistic conservation efforts, especially if naturalistic bonds with wilderness are combined with a worldview of cooperative synergy. But, although natural awe drives many people to actively preserve the wild world as it is, it moves others to assert their dominion and feed their pride by laying claim to wilderness for their own purposes. Not all wildlife photographers work actively to promote the safety of the stunning wildlife and glorious wilderness depicted in the images they sell. Many naturalists explore the diminishing habitat of rare and endangered species with zeal; yet, give little more than lip service to the conservation of the objects of their exploration. Even the most broad-minded and nature-loving conservationists sometimes swerve from their altruistic activities when enticed by the attractions of fame, fortune, and corporate ascension.

Many primatologists have chosen their fields of endeavor owing to profound events that stirred and satisfied different types of biophilia. But, to seek connections with nonhuman primates and their habitats to satisfy the human need to affiliate with,

learn about, or be uplifted by other life forms and natural ecosystems does not necessarily account for the needs of the nonhumans. In his studies of human attitudes toward nature, Kellert [1996] reports that the most prevalent biophilia-driven attitudes are part of the utilitarian value structure that stresses the benefits of wildlife for human sustenance, protection, well-being, and security. As demonstrated in the various effects of humanistic, scientific, and naturalistic bonds mentioned above, people who make a living by or seek comfort from interacting with wildlife and wilderness are operating through overarching utilitarian values that can distort their awe, fascination, and affection, often turning the other animals into vehicles for their own advancement and pleasure. Utilitarian distortion of biophilia-driven bonds with other animals tends to foster narrow perspectives, limited capacity to serve those animals, and a possessive desire to isolate those animals from others.

Crucial to biophilia's weaknesses as a motivator of effective conservation is it's conception and enactment as a uniquely human drive, causing people to overlook or deny the other animals' needs and feelings in relation to us and to other species. From the point of view of the global conservationist, the human/nonhuman primate bond is often seen as a one-way assertion of our desires to utilize other beings for our own self-centered and self-controlled purposes [Rose, 2008]. For humankind to restore and preserve nonhuman primates in the wild, human bonds with other species and devotion to pristine wilderness must acknowledge all interspecies needs. The science and practice of primate conservation must focus on harmonizing interspecies relationships in critical ecosystems, rather than merely satisfying our human-centered urge to affiliate with, admire, understand, and protect other forms of life that are akin to us. Biosynergy must be fostered as the primary driving force of human/nonhuman primate bonds, if primatologists are to promote and sustain the mutual benefits of interspecies cooperation and ecosystem synergy that can lead to global biodiversity conservation and the restoration of the biosphere [Rose, 2002, 2009; Rose & Mittermeier, 2007].

DEFINING AND FOSTERING BIOSYNERGY

Biosynergy, as a key element of a universal synergistic process that is fundamental to evolution and survival, is so complex as to defy simple definition. The writings of Corning [Corning, 2003, 2005] give a sense of its scope in the global systems context. Here is this author's latest attempt to define it as a biopsychosocial phenomenon:

bi · o · syn · er · gy *n.*

1. The interaction of two or more bio-psycho-social agents or forces so that their combined effect is different from the sum of their individual effects.
2. Cooperative interaction among species, especially among the individuals and groups in an ecosystem, that creates an enhanced combined effect.
3. The theory that organisms of all species cooperate with passage of time in the same ecosystem, so that biosocial structure and dynamics change to assure the mutual vigor of all life forms and the thriving of shared ecosystems. (Greek, from *bios*, life. From Greek *sunergia*, cooperation, from *sunergos*, working together.)

The hypothesis of cooperation for mutual benefit is key to this treatise. In recent decades, scientists have exposed the importance of social coevolution in the development of earth life [e.g. Axelrod, 2006; Corning, 1996; Trivers, 1971]. Animal and plant societies thrive through processes of adaptive conformity, creativity, and collaboration within and among species, attenuated by suppression or rejection of severely destructive individuals and groups. The most prolific life forms on the planet are those that undertake intricate social collaboration in synchrony with environmental and ecological change. Paradoxically, synergy within conflicting human groups organized to do collective violence on one another often produces severe collateral damage to other species and ecosystems [Corning, 2007]. It seems that when social collaboration is inspired by mutual concern for the synergy of all life, biosynergy prevails and human societies and wild ecosystems thrive.

Corning suggests that, after decades of scholarly research and theory building, synergy is more than a driving force in the evolution of life, but is a crucial factor in assuring the fate of humankind:

> Synergy is one of the great governing principles of the natural world. It has been a wellspring of creativity in the evolution of the universe and it has greatly influenced the overall trajectory of life on Earth. It has played a decisive role in the emergence of humankind. It is vital to the working of every modern society. And it is no exaggeration to say that our ultimate fate depends on it. [Corning, 2003; p 1]

In this brief commentary, it is impossible to back up the importance of synergy in the overall trajectory of life on earth, as Corning has done in thousands of pages of scholarly writing for three decades. To change this from apparent hyperbole to accepted knowledge requires reading Corning's books for the elaborate explanations, as this author has been doing slowly during the past 2 years. Accepting the premise that: genes are synergistic and selfish, individuals and species are cooperative and competitive, earth-life is blessed and doomed, this author is compelled

to consider very carefully the possibility that biosynergy must become the driving force in our species relationships with nature, if life on earth is to flourish rather than flounder and fail.

In order to foster biosynergy across the planet, a sea change in attitudes and actions need to take place in lay people and wildlife aficionados alike. Although human altruism toward other species is crucial, it will fail if undertaken in a paternalistic manner. Biosynergy produces interspecies harmony when all creatures, great and small, are equally important collaborators in the process. Humanity must accept the contribution of every ant and ape, virus and viper, weed and wilderness, if biosynergy is to prevail in restoring the health of natural ecosystems and the biosphere.

PRIMATOLOGY AND THE BIOSYNERGY PARADIGM

To contribute to biodiversity conservation, primatologists must look beyond single species cooperation and interspecies competition. To compare species-specific cooperation modes of humans and other primates [Kappeler & van Schaik, 2006] is instructive. Anthologies that focus on human/nonhuman primate interconnections of human cultures in primate habitats [Fuentes & Wolfe, 2002] and on human/nonhuman conflict and commensalism [Patterson & Wallis, 2009] are important. But, to preserve biodiversity, primatology needs to embrace, develop, and apply a biosynergy paradigm that includes a multileveled, interactional research focus; one which gives balanced weight to both reductionist and holistic perspectives and invites both intra and interlevel analyses and explanatory models [Corning, 2003]. A top priority is to study and promote human/nonhuman primate biosynergy on a global basis. When primatologists present bonds with nonhuman primates in the global media, it must produce more than biophilia-induced human fascination for monkeys and apes. Human/nonhuman primate bonding needs to be studied and reported as a facet of the greater goal to foster worldwide biosynergy. This can only be accomplished if primatologists open their minds and organizations to professionals in broad human-related fields, from advertising to agribusiness, social change to psychiatry, theology to theatre arts, politics to philanthropy, and medicine to marketing [Rose, 2001]. In so doing, inclusive, synergistic global conservation campaigns can be developed with the capacity to make biosynergy among humans and the rest of nature a key mechanism for assuring survival of primates in the wild, and of all life on earth.

THE FUTURE OF PRIMATES AND PARADISE

Human synergy with other animals is more than a palliative in a world seemingly doomed by human hegemony. Biosynergy is a requisite for all life on earth to survive and to thrive, including human life. Although it is clear that we humans suffer when deprived of emotional affiliation to other living organisms [Louv, 2005], biophilia is not enough. For human lives to be whole and healthy, our relationships with other species must be reciprocally supportive, multidirectional, and global. To realize their full potential, living beings need synergistic relationships with the other organisms in their ecosystems, and ultimately throughout the biosphere [Rose, 2008]. To attempt to conserve wild apes and not their synergistic relationships with indigenous and local people will fail. To study wild monkeys and ignore their interactions with human observers, predators, and protectors will uncover no vital truths. To synergize wild primates and wilderness and not humanity and civilization cannot be accomplished. We must study, conserve, and promote the biosynergy that stirs all individuals and all species to collaborate in harmony for the greater good of life on earth [Rose, 2004, 2009]. To reach our highest potential as primatologists and people, we must strive humbly to harmonize civilization and nature in the pursuit of a new paradise restored and sustained by global biosynergy.

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