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KINCENTRIC ECOLOGY: INDIGENOUS PERCEPTIONS OF THE HUMAN–NATURE RELATIONSHIP

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Abstract. Indigenous people view both themselves and nature as part of an extended ecological family that shares ancestry and origins. It is an awareness that life in any environment is viable only when humans view the life surrounding them as kin. The kin, or relatives, include all the natural elements of an ecosystem. Indigenous people are affected by and, in turn, affect the life around them. The interactions that result from this “kincentric ecology” enhance and preserve the ecosystem. Interactions are the commerce of ecosystem functioning. Without human recognition of their role in the complexities of life in a place, the life suffers and loses its sustainability. Indigenous cultural models of nature include humans as one aspect of the complexity of life. A Rarámuri example of *iwígara* will serve to enhance understanding of the human–nature relationship that is necessary in order to fully comprehend the distinct intricacies of kincentric ecology.

Key words: *ceremonial cycle; Chihuahua, Mexico; human–nature relationship; indigenous land management; interconnectedness; iwígara; kincentric ecology; Rarámuri; Sierra Madres; Tarahumara.*

INTRODUCTION

Laguna Indian, author, and poet Leslie Marmon Silko notes that human beings must maintain a complex relationship with “the surrounding natural world if they hope to survive in [it].” To Silko, humans could not have “emerged” into this world without the aid of antelope and badger. The Lagunas’ sustained living in the arid region of the Southwest could not have been viable without the recognition that humans were “sisters and brothers to the badger, antelope, clay, yucca, and sun.” It was not until they reached this recognition that the Laguna people could “emerge” (Silko 1996).

Leslie Marmon Silko elegantly expresses how indigenous people in North America are aware that life in any environment is viable only when humans view their surroundings as kin; that their mutual roles are essential for their survival. To many traditional indigenous people, this awareness comes after years of listening to and recalling stories about the land. Silko notes that, “I carried with me the feeling I’d acquired from listening to the old stories, that the land all around me was teeming with creatures that were related to human beings and to me” (Silko 1996). This “feeling” survives and is reviving in indigenous people today.

My culture, the Rarámuri, also known as Tarahumara, occupy one of the most biologically diverse regions in the world (Ramamoorthy et al. 1993, Felger et al. 1994). Our homeland, a region we call *Gawi*

Wachi (the Place of Nurturing) is located in the eastern Sierra Madres of Chihuahua, Mexico. There are approximately 60 000 Rarámuri who continue to live a traditional lifestyle of horticulture, gathering, and agroforestry.

Rarámuri spirituality was historically influenced by Jesuit Catholicism, yet the ceremonies, rituals, and manners of giving thanks to the land remain primarily pre-Columbian.

The northern Sierra Madre Occidental, the homeland of the Rarámuri, represents a biologically rich zone of contiguous montane woodland, which reaches north from southern Mexico nearly to the international border (Felger et al. 1994). The complex geography, topography, and elevational changes result in the astounding amount of biodiversity in the region. At least eight physiognomic vegetation types can be found in the region. These include montane evergreen forest, oak-coniferous woodland, tropical deciduous forest, oak savanna, chaparral, shortgrass prairie, subtropical thornscrub, and subtropical desert fringe (Felger et al. 1994). It is suggested that the Madrean region of northwest Mexico houses two of the richest floras of Mexico, which “ranks as one of three top megadiversity centers in the world” (Ramamoorthy et al. 1993). It is estimated that 4000 vascular plant species are found in the region, of which 150 are endemic (Felger et al. 1994). In the Rarámuri region of the central Sierra Tarahumara alone, as many as 1900 plant species can be found (Felger et al. 1994). Many varieties of insects have been identified, along with 65 species of reptiles and amphibians, of which 17 are endemic. Between 260 and 295 species of birds breed in the region, and many more

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species migrate to or visit the area. Ninety-two different mammals roam the area, including several that are rare or threatened.

The region is also rich in useful plants. Eighteen races of pre-hispanic crops grow in the Sierra Madres (Felger et al. 1994). They include species of *Agave*, *Lepidium*, *Hyptis*, and *Panicum*. Other plants used for medicine and food include species in the Cactaceae, Asteraceae, Fabaceae, Lamiaceae, and Solanaceae. Wild relatives of domesticated plants occur in the area, including species of *Agave*, *Cucurbita*, *Phaseolus*, *Prunus*, and *Solanum*.

It is no accident that the Rarámuri homeland is biologically diverse, as we have managed this region for at least 2000 years (Zingg 1940). About 350 different plant species are used by the Rarámuri for food and medicine. Mestizo populations in the area recognize and use only about 40% of those used by the Rarámuri (Salmón 1995). These numbers reflect the strong relationship and connection that the Rarámuri maintain with their environment.

In 1935, when William Bennett and Robert Zingg were conducting anthropological fieldwork in the Sierra Madre, the vast majority of Rarámuri were employed in traditional lifestyles and traditional management (Bennett and Zingg 1935). Today, I estimate that ~50% of Rarámuri men work in some form for Mexican and Mestizo commercial operations. This employment may involve logging, mining, or ranching. Although many men work in nontraditional occupations, it is seasonal work and coincides with times of the year when their crops do not have to be tended. Therefore, the men still spend much of their time in traditional agriculture. Most Rarámuri women will not work outside the home. The women and children spend much of their time caring for livestock. I estimate that up to 95% of the Rarámuri population still practices traditional land ways in some form, including speaking the language and participating in ceremonies.

KINCENTRIC ECOLOGY: SHARING BREATH WITH OUR RELATIVES

Indigenous languages express abstract concepts related to the land differently than does the English language. Consequently, the term "kincentric ecology" would be meaningless to indigenous language speakers (Martinez 1994a). However, speakers of indigenous languages can express the concept of kincentric ecology in traditional terms. Kincentric ecology will be further illuminated through the Rarámuri concept of *iwígara*. The following description of *iwígara* will reveal the complexities of the indigenous perceptions of self and culture intertwined in the web of life.

The Rarámuri view themselves as an integral part of the life and place within which they live. There is among the Rarámuri a concept called *iwígara*, which encompasses many ideas and ways of thinking unique

to the place with which the Rarámuri live. Rituals and ceremonies, the language, and, therefore, Rarámuri thought are influenced by the lands, animals, and winds with which they live. *Iwígara* is the total interconnectedness and integration of all life in the Sierra Madres, physical and spiritual. To say *iwígara* to a Rarámuri calls on that person to realize life in all its forms. The person recalls the beginning of Rarámuri life, origins, and relationships to animals, plants, the place of nurturing, and the entities to which the Rarámuri look for guidance.

A way to delve deeper into the concept of *iwígara* is to examine how it is reflected in a traditional ritual, *yúmari*. *Yúmari* songs often make references to *sewára*, flowers. In one specific *yúmari* song, reference is made to *sumati okilivea*, the beautiful lily. *Yúmari* dances and songs are performed to heal people as well as animals and the land. During *yúmari* ceremonies, the women are asked to dance. Women do not dance except for *yúmari*. The women dance in a continual *iwí* (circle), while two male singers and chanters dance within the moving circle. The songs ask that the land be nourished and that the land will nourish the people. The land is nourished by the results of the ceremony, which brings rain. As the songs are performed, the *iwí* continues to turn. The *iwí* represents the fertility of the land. *Iwí* can convey other meanings, however. It translates roughly into the idea of binding with a lasso. But it also means to unite, to join, to connect. Another meaning of *iwí* is to breathe, inhale/exhale, or respire.

Iwí also makes reference to the Rarámuri concept of soul. It is understood that the soul, or *iwí*, sustains the body with the breath of life. Everything that breaths has a soul. Plants, animals, humans, stones, the land, all share the same breath. When humans and animals die, their souls become butterflies that visit the living. The butterflies also travel to the Milky Way, where past souls of the ancestors reside.

Iwí is also the word used to identify a caterpillar that weaves its cocoons on the madrone tree (*Arbutus* sp.). The implication is that there is a whole morphophysiological process of change, death, birth, and rebirth associated with the concept of *iwí*. *Iwí* is the soul or essence of life everywhere. *Iwígara* then channels the idea that all life, spiritual and physical, is interconnected in a continual cycle. *Iwí* is the prefix to *iwígara*. *Iwígara* expresses the belief that all life shares the same breath. We are all related to, and play a role in, the complexity of life. *Iwígara* most closely resembles the concept of kincentric ecology.

As another example, the Rarámuri term *numatí*, or things of the natural world, are relatives, but in a realistic sense. In a previous world, people were part plant. When the Rarámuri emerged into this world, many of those plants followed. They live today as humans of a different form. Peyote, datura, maize, morning glory, brazilwood, coyotes, crows, bears, and deer

are all humans. Rarámuri feel related to these life-forms much as Euroamericans feel related to cousins and siblings (Levi 1993).

The natural world, therefore, is not one of wonder, but of familiarity. The human niche is only one of a myriad of united niches that work together to continue the process of *iwígara*. If one aspect of the lasso is removed, the integrity of the circle is threatened and all other aspects are weakened. A certain attachment results from knowing that some of your relatives are the life-forms that share your place with you. This belief influences one's sense of identity and thought/language.

The physical, social, spiritual, and mental health of the Rarámuri are closely related to the cycle of ceremony adhered to by the culture. *Onoruame* is the creator and provider of corn (*Zea mays*) and life. Corn is a staple food of the Rarámuri. It is eaten raw, made into tortillas, used in soups, and as tamales. As a medicine, the meal itself is sprinkled onto patients as a blessing. The tassels are used in a recipe with other plants to cure dysentery and for kidney problems. Most importantly, the Rarámuri owe their emergence into the world to corn. It is believed that the Rarámuri emerged from ears of corn after a great flood and the destruction of a previous world.

Therefore, in order to honor *Onoruame* for his gifts and for life, the Rarámuri are obligated to prepare and consume their traditional corn beer, known as *batari-ki*. *Batari-ki* is usually drunk only during the special corn beer festivals, called *tesguinadas*, which are an integral part of most Rarámuri events, including religious festivals, ceremonial dances, and curing rituals (Salmón 1991).

Through the ceremony, ritual, dances, and songs associated with *batari-ki*, Rarámuri connections to the Creator are strengthened. Rain is assured and, therefore, the life of the land and the plants, animals, and people. An important cycle of existence is assured with the consumption of *batari-ki*. More importantly, a maintenance of the relationship with their world occurs while they continue to fit harmoniously into it. It is a continuous interconnected cycle of breath and life. As will be seen, Rarámuri land management is one facet of a need to continue the complex cycle of breath that enhances the land.

KINCENTRICALLY MANAGING THE LAND

Over the centuries, methods of land use were developed that adhered to a kincentric understanding. Horticultural and agricultural techniques included selective coppicing, pruning, and harvesting, gathering, cultivation, transplanting, vegetative propagation, sowing, discriminant burning, and weeding (Bye 1976, 1981, Martínez 1993). Some plant populations and individual plant species were intentionally selected "in accordance with ecological principles" in order to in-

crease population "abundance, diversity, growth, longevity, yield, and quality to meet cultural needs" (Martínez 1994a, b). As an example, some corn is selected for its ability to produce naturally occurring sugars, which enhances its fermentation qualities in making corn beer. Ecologically, this is a sound practice because the corn beer is a necessary element in keeping the Creator strong and bringing the rain. Another example involves the practice of moving individual species of edible chenopods from their natural habitat to the edges of agricultural fields. The greens come from fields where the breath (*iwí*) of the field is considered strong. In translation, this means that the population of the greens is abundant.

The concepts of kincentric ecology, or *iwígara*, are at the heart of Rarámuri land management philosophy. It is *iwígara* that guides agriculture, medicine, and foraging. The use of plants for healing and for food offers a fundamental relationship from which the Rarámuri view themselves as participants in their natural community. The Rarámuri understand that they were placed here as caretakers of their land, but also to aid in the health of the Creator, who works hard each day to provide for the land and its inhabitants.

For the Rarámuri, caretaking translates to practices such as transplanting edible greens to corn and bean fields. The greens become easily available for the people and, in return, become more abundant through the cultivation and irrigation that occurs alongside the corn and beans. Caretaking also means that only the longest pine needles collected for making pine-needle baskets are selected. The shorter ones are left to be collected next time; the collecting enhances new growth of the needles just as pruning does to fruit trees. Therefore, caregiving is a method of using the land while enhancing it.

Rarámuri women use several natural materials for weaving. Sotol (*Dasyllirion simplex*), yucca (*Yucca decipens*), and beargrass (*Nolina matapensis*), comprise the three most widely used basket materials, along with pine needles. There has been a large tourist demand for Rarámuri baskets since the Chihuahua-Pacific Railroad opened the region to tourism in the 1960s. Baskets are sold on a daily basis along the railway, in the numerous gift shops in the region, and to the traders who ship them by the railcar load to the United States. It would seem that overharvesting of weaving materials might be a hazard. Yet the materials, found in the pine forests and along the walls of the *barrancas* (canyons), are carefully managed. This is due largely to the collection philosophy influenced by kincentric ecology. Traditional harvesting of these basket-making materials is periodic. Only the intermediately aged leaves are collected, which sustains the health of the plants and suppresses sexual reproduction in favor of vegetative propagation (Bye et al. 1995).

As previously mentioned, part of the traditional man-

agement regimen for basket materials involves burning. Burning is employed in the management of other plants as well. The understory of oak groves is burned to retard new growth of oak and other trees and plants that would compete with the existing oaks. This results in higher yields of acorns and also in some fruit-producing shrubs such as chokecherry (*Prunus capuli*) and manzanita (*Arctostaphylos pungens*).

Overharvesting is an enduring concern in the Sierra Tarahumara, where arable land is cherished and where the pressures of logging and narcotrafficking are making sustainable horticulture tenuous. Yet for centuries, up to the modern period, the Rarámuri have managed and harvested the Sierra and *barrancas* in a manner that is sustainable. Pockets of small fields grew and continue to grow in the bottomlands and *arroyos* of the Sierra, while *milpas* (terraces), some at 45° angles, pose in bright green contrast to the oak forests along the upper reaches of the *barrancas*. In its strictest translation, “*milpa*” means cornfield. But to the Rarámuri, *milpa* is a concept of optimal land use that does not destroy the land. The *milpas* are usually placed at locations where they take best advantage of runoff or are near existing springs. Because of their small size, usually less than 12 × 12 m (40 × 40 feet), the *milpas* impose less on the native plants and require less tilling that erodes native soils. Making optimum use of arable land is a skill that has flowered from centuries of a relationship to the Sierra and from a philosophy of *iwígara* borne from the place.

Wild edible plants are treated with the same respect as the medicinals. When collecting wild onions, *Allium lingifolium*, the Rarámuri often select the larger bulbs, leaving the smaller ones in the ground, thus promoting a second harvest. In addition, the Rarámuri use digging sticks to harvest the bulbs. The ground in which the onions grow is continuously disturbed, encouraging further growth of the plants and decreasing the competitive perennials. A symbiotic relationship exists between the Rarámuri and the onions. Disturbance of the sod and selective harvesting encourage the populations and assure a harvest of onions (Bye 1976).

In return for Rarámuri care, the land provides a cornucopia. *Sepé*, or wild greens, are collected by nearly all Rarámuri to augment the daily diet. *Sunú*, corn, is a staple eaten at nearly every meal. The Rarámuri grow beans, potatoes, squashes, wheat, and a variety of other products, both Old and New World in origin. Another side effect of Rarámuri management of the Sierra is the reservoir of medicinal plants that are potentially valuable outside the Sierra. The Rarámuri employ approximately 350 different plants for medicine and food (Salmón 1995). The land also permits the raising of goats, sheep, chickens, and pigs. Some Rarámuri raise cows and horses.

How the Rarámuri embody the concept of kincentric ecology in their minds is more difficult to document.

Through conversations and careful observation, however, it is possible. An elder Rarámuri consultant often allows me to accompany him on his plant-collecting forays into the mountains near his community in Chihuahua, Mexico. He prefers to collect some of his medicinal plants from a particular *rincón*, or corner, of a large arroyo. He collects from other favorite locations as well, all of which he says are places in which the best plants grow.

Walking to his *rincón*, we passed by several plants of the same species that we were intending to harvest that day. When we reached his *rincón*, there was an abundance of the particular plants. About a bushel was collected, with little impact on the population. When questioned as to why we did not collect the plants that we passed on the trail, he asserted that “those plants are not right for harvest because they are in the wrong place.” Later examination revealed that the populations of plants that were passed were sparse in number when compared to those that were eventually harvested.

There is an understanding that harvesting threatened populations is not ecologically sound. Yet, he would not explain the situation in this manner. He suggested that the *iwígara* in these low-population areas is “weak” and must, therefore, be allowed to be strengthened before the plants there are of any use. In further conversation, he explained that collecting the plants in the *rincón* was good, because thinning them out actually helps the *iwígara* in the other plants to strengthen. He mentioned that their roots become entangled, thus weakening their breath. In addition, he mentioned that the plants like to be near each other because they share their breaths. Experience told him which populations were harvestable.

Rarámuri land management represents a tradition of conservation that relies on a reciprocal relationship with nature in which the idea of *iwígara* becomes an affirmation of caretaking responsibilities and an assurance of sustainable subsistence and harvesting. It is a realization that the Sierra Madres is a place of nurturing, full of relatives with whom all breath is shared.

Today, in the Sierra Tarahumara, logging, mining, grazing, and other extractive industries are on the rise. As a result, the biodiversity of the Sierra Madres is threatened. Loss of forest canopy due to logging is decreasing the availability of useful plants as well as animals. The Rarámuri of 60 years ago supplemented their diets with many edible plants as well as deer. Today, deer hunting is almost unheard of and people complain of having to travel farther for edible greens and medicinal plants. Both mining and logging have resulted in the cutting of dirt roads that crisscross the Sierra and generate erosion problems.

Another threat to the biodiversity of the Sierra is increased grazing as Mestizo ranchers encroach on Rarámuri lands. Grazing is not a new practice in the Sierra. Spaniards introduced sheep and goats to the Rarámuri

during the 17th century, but the Rarámuri adopted this addition to their lifestyles and diets and made it their own. Sheep and goats furnish the Rarámuri with clothing, food, and weaving materials. In addition, the animals furnish manure which adds to Rarámuri methods of increasing the productivity of their fields. When the animals are not grazing and adding manure to Rarámuri fields, they are allowed to graze commonly held hill-sides and pastures. They are constantly moved so as not to overgraze any one area.

Despite the environmental threats to the Rarámuri homeland, the diversity of both flora and fauna remains rich. The Sierra is a valuable seed bank for ancient strains of domesticated plants. Strains of panic grass (*Panicum texanum*, *P. fasciculatum*), amaranth (*Amaranthus palmeri*), and other edible greens, as well as corn, beans, and squashes, continue to be harvested. In addition, teosinte and tripsicum, thought to be the progenitors of maize, survive in the Sierra. Although deer are less numerous, they survive in the Sierra along with black bear, ocelots, puma, eagles, hawks, and many other mammals and birds.

RELATIONSHIP BETWEEN HUMANS AND THE NATURAL WORLD

Indigenous cultures of North America include human communities in their cultural equations of nature. To indigenous people, humans are at an equal standing with the rest of the natural world; they are kindred relations. In addition, indigenous people believe that the complex interactions that result from this relationship enhance and preserve the ecosystem. It is understood that human practices such as burning and pruning promote new growth of shrubs, trees, and grasses. This attracts animals such as birds to sprouting trees and shrubs, and mammals such as deer and elk to grasslands. This concept of kincentricity with the natural world is what is being referred to as "kincentric ecology."

The natural world is referred to in various ways by indigenous languages. The Yoeme of Sonora, Mexico and southern Arizona use the terms *huya ania* to describe natural areas outside the boundaries of their villages (Evers and Molina 1987). The term roughly translates to mean nurturing life. The Rarámuri use the idea of *gawi wachi*, the place of nurturing, to describe the Sierra Madres (Salmón 1995). The Mid-Columbia River Indians use the Sahaptin term *tiicám*, which means "the land" (Hunn et al. 1990). No matter the terms, they all make reference to the complex flow of life with which they and their ancestors have lived interdependently for centuries. Nearly all indigenous cultures share a set of structures, (expressions, metaphors, concepts) that describe their links to the natural world (Cajete 1994).

Indigenous people believe that they live interdependently with all forms of life. Their spiritual, physical,

social, and mental health depends on the ability to live harmoniously with the natural world. Indigenous identity, language, land base, beliefs, and history are personifications of culture that regulate and manifest the health of the human as well as the natural world. It is understood that a person who harms the natural world also harms himself.

History, identity, language, land base, and beliefs connect, secure, and regulate the human-nature relationship. To indigenous people, history does not remain in a linear past. History is continuous and, more importantly, contextual. Cultural history is the origins of humans and nature. For many cultures, their origins are a result of relationships to animals, plants, etc. The Abenaki believe they were created from ash trees. The Lenape say that humans sprang from a "great tree." The Mayans and Rarámuri believe they came from Corn (Caduto and Bruchac 1995, Salmón 1995). The Hopi owe their emergence into this world to a spider, a spruce tree, a pine, and a stalk of bamboo, which functioned as ladders through the *sipapu* into the Fourth World (Courlander 1971).

The land base is often a central subject in nearly all indigenous stories of historical origins. They often mention how they emerged in one way or another from the land. The land base, however, is the land to which they claim a relationship. It may be the land on which they now live, or a historical, or even mythical place to which they claim relationship. Nevertheless, the life-forms that occupy the cultural land base are direct relatives to the culture.

The concepts of identity and language are connected to indigenous peoples' concepts of self. Words shape thought. Thought is an expression of spirit. Many indigenous people feel that both humans and other life-forms are essentially spirit and matter. Both are manifestations of the interdependency of humans and nature. Self-identity is a result of a developed relationship to the environment as it is perceived by the culture. Cultural perception stems from language and thought. The human-nature relationship intertwines to both the land and cultural histories.

To all cultures, beliefs form and explain the human-nature relationship. Beliefs help a person recognize his/her link to the natural world and his/her responsibility to ensure its survival. No person is truly connected to the natural world or to his/her culture if he/she does not maintain physical, social, spiritual, and mental health; together, they form the breath of life. Breath is the matter and energy, which indigenous people believe moves in all living things. Maintaining a balanced and pure human breath also ensures the purity and health of the breath of the natural world.

With the awareness that one's breath is shared by all surrounding life, that one's emergence into this world was possibly caused by some of the life-forms around one's environment, and that one is responsible for its

mutual survival, it becomes apparent that it is related to you; that it shares a kinship with you and with all humans, as does a family or tribe. A reciprocal relationship has been fostered with the realization that humans affect nature and nature affects humans. This awareness influences indigenous interactions with the environment. It is these interactions, these cultural practices of living with a place, that are manifestations of kincentric ecology.

CONCLUSIONS

This essay presents an indigenous perception of ecology, referred to as kincentric ecology. Kincentric ecology pertains to the manner in which indigenous people view themselves as part of an extended ecological family that shares ancestry and origins. It is an awareness that life in any environment is viable only when humans view the life surrounding them as kin. The kin, or relatives, include all the natural elements of an ecosystem. Indigenous people are affected by and, in turn, affect the life around them. A cultural model of kincentric ecology is presented that illustrates indigenous relationships with the natural world. The cultural model of nature includes humans as one aspect of the complexity of life.

In terms of indigenous land management techniques, interactions resulting from kincentric ecology enhance and preserve the ecosystems with which indigenous people have lived for centuries. Indigenous land management systems reflect the kincentric relationship that indigenous cultures maintain with their natural resources.

Finally, it must be mentioned that when ecologists, land managers, environmentalists, and conservationists speak and write about endangered species and their potential loss, they rarely mention the loss of human cultures that work to enhance their homelands. Cultures such as the Rarámuri represent a group of people that maintain and nurture their place through their traditional land management practices. They maintain the environmental integrity of the Sierra Tarahumara, which would quickly decline, we believe, if the Rarámuri culture were to disappear. Fortunately, Rarámuri culture is viable despite modern encroachment. Their educational system ensures that the beliefs and traditional land practices are being transferred between elders and children, which ensures the integrity of the Sierra Madres.

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