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The Web of Life: Human Symbiosis with Other Life Forms and the Environment

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Abstract

Although this is rarely discussed or acknowledged, humans are symbiotic with other life forms and with the environment. The most commonly recognized symbiotic relationships are animals and plants raised by farmers. Less acknowledged are actually those who are most intimately symbiotic with humans, namely the microbes in our bodies. There are ten times as many microorganism cells in our human body as there are human cells. We cannot survive without these friendly microorganisms. They, in turn, depend upon us to host them in our bodies. Humans have numerous other symbiotic relationships that support and sustain our lives as well. The bad news is that humans have exploited their powers over the other life forms and over the natural resources on our planet – to the point that we may not be able to sustain human life for much longer. The good news is that increasing numbers of people are becoming aware that it would be of enormous help to humanity, to all other living beings on our planet, and to our planet herself if we can improve these symbiotic relationships.

Key words: symbiosis, interbeing, collective consciousness, bacteria, human, parasite, environment, land, water, air

Background

> *The web of our life is of a mingled yarn, good and ill together.*
> - Shakespeare (All's Well that Ends Well)

Humans live in closely interdependent relationships with numerous other living organisms.

- Humans raise bees, who pollinate fruit and vegetable blossoms and provide honey.
- Humans have pets who offer love, playfulness and cuddles with benefits of a warm home and regular meals, and, hopefully, love, playfulness and cuddles in return.
- Less acknowledged are actually those organisms most intimately cohabiting with humans, the microbes in our bodies.

These are mutually beneficial symbiotic relationships

- Farm animals and plants provide food for humans and are bred and tended by humans.

These are examples of exploitative symbiosis, where the plants and animals are used primarily for human benefits.

- Humans clear-cut forests (for profit on the wood and to clear land for buildings), which otherwise would protect the land from soil erosion and which absorb carbon dioxide from the atmosphere.

This is a parasitic symbiosis.

This discussion will consider some of the problems in the ways we humans are relating with our evolutionary life partners on this planet and will suggest ways we could do better. This is not just an intellectual or research examination of life on our planet. This is a consideration that has vast, life and death consequences for life as we know it today and whether we and most other living beings on this planet will survive the choices humans are making.

Because there has been little acknowledgment of human symbiotic coexistence with other life forms on this planet, I start with a detailed exploration of the many forms that symbiosis can take. First, you will find a review of conventional classifications of symbiosis. Next, you will see how there are other, much broader, yet vitally close interdependencies between various species; and equally vital interdependencies between living beings and the earth herself.

Humans have developed an increasingly parasitic symbiosis with our planet. Sadly, this largely unacknowledged parasitism is leading us to a suicidal destruction of our the earth that gives us sustenance. I conclude with suggestions for ways in which we can understand some of our parasitic behaviors, plus ways in which we could halt our march to collective suicide and reverse the parasitic damage we are doing. We could definitely steer our world towards better outcomes!

Symbiosis

When diverse organisms live together with benefits to one of the pair or to both organisms this is called symbiosis or mutualism. Though present in nature and in human experience for many thousands of years, such relationships have only been explicitly named and acknowledged by the scientific community since 1879 (Douglas, 1994).

There are many variations in the types and extent of symbiotic interdependencies between diverse life forms. (This section is quite detailed and a casual skim may suffice for many readers.)

Symbiotic mutualism

These are relationship between individuals of different species where both individuals benefit. The types and degrees of closeness in the relationships of the paired organisms is a complex and sometimes disputed matter. In the strict, scientific use of the term symbiosis, only lifelong interactions involving close physical and biochemical contact are generally considered symbiotic.

Mutualistic relationships may be either obligate for the survival of both species, obligate for one but facultative (optional) for the other, or facultative for both. Many biologists restrict the definition of symbiosis to close mutualistic relationships.

Obligate symbiosis – both symbionts entirely depend on each other for survival.

- Many lichens consist of a fungus and photosynthetic partner, usually either a green alga or a bacterium that uses photosynthesis for energy. The physical forms, physiology and biochemistry of lichens are very different from those of the isolated fungus and alga on their own. Lichens occur in some of the most extreme environments on E arth, like the arctic tundra, hot deserts, rocky coasts and toxic slag heaps. They also grow abundantly on leaves and branches, on bare rock, including walls and gravestones. They do not depend on the trees or rocks for sustenance, so in their combined form they are not symbiotic with the surfaces to which they adhere.

Lichen on tree branch

- Most land plants and land ecosystems rely on mutualisms between the plants, which 'fix' (absorb and chemically transform) carbon from the air, and on certain fungi, which help in extracting water and minerals from the ground (Harrison, 2005). The mycorrhiza is a symbiotic association between the fungus and the roots of a vascular plant. This mutualistic association provides the fungus with relatively constant and direct access to carbohydrates, such as glucose and sucrose produced by the plant. The carbohydrates are translocated from their source (usually leaves) to root tissue and on to the plant's fungal partners. In return, the plant gains the benefits of the mycelium's higher absorptive capacity for water and mineral nutrients due to the comparatively large surface area of mycelium to root ratio, thus improving the plant's mineral absorption capabilities (Harrison, 2005; Kirk, et al., 2001; Selosse, et al. 2006).

- Coral reefs represent mutualisms between coral organisms and various algae living inside them.

  Most reef-building corals have a mutually beneficial symbiotic relationship with a microscopic unicellular algae that lives within the cells of the coral's gastrodermis. Corals provide the algae a protected environment and compounds necessary for photosynthesis, which are metabolic waste products of the coral. In return, algae produce oxygen and help corals remove wastes. Most importantly, they supply the coral with organic products of photosynthesis which are predominantly carbohydrates. These compounds are utilized by the coral as building blocks in the manufacture of fats, as well as the synthesis of their calcium carbonate ($CaCO_3$) skeletons. Zooxanthellae often are critical elements in the continuing health of reef-building corals. As much as 90 percent of the organic material they manufacture photosynthetically is transferred to the host coral tissue. (National Oceanic and Atmospheric Administration, Web reference)

- A large percentage of herbivores (such as cows, horses, pigs and other grazing animals) have mutualistic gut flora (organisms) that help them digest plant matter (Moran, 2006). Their gut flora is made up of cellulose-digesting protozoans or bacteria living in the herbivores' intestines.

While the above examples of symbiosis in various organisms are well recognized and well accepted, the symbiotic relationships between humans and other living beings have been ignored, minimized or dismissed for the most part. It appears that humans are reluctant to admit we are vitally linked with other living beings, to the point that humans cannot survive without their support. The most striking example of this are the microbes residing in the human gut.

Research suggests that the relationship between gut flora and humans is a mutualistic relationship (Sears, 2005). Human intestines carry about 100 trillion microorganisms – ten times greater than the total number of human cells in the body (Guarner & Malagelada, 2003; Qin, Li, Raes, et al., 2010; Savage, 1977; Sears, 2005; Steinhoff, 2005). These include between 300 to 1000 different microorganism species (Gibson, 2004; Malagelada, 2003; Ohara, et al. 2006; Sears, 2005; Steinhoff, 2005. Bacteria make up most of the colon flora and up to 60% of the dry mass of feces. About 99% of the bacteria are from 30 or 40 species. Fungi, protozoa, and archaea (organisms without nuclei) also are part of the gut flora, but their activities are not well understood.

Human gut flora provide multiple benefits to their hosts. These include the energy obtained from microbial fermentation of undigested carbohydrates and the subsequent absorption by the human of various biochemical building blocks. These are needed by the human cells lining the gut, the liver and muscles. Intestinal bacteria also play a role in regulating the development of the gut; synthesizing vitamins B and vitamin K; metabolizing bile acids and other chemicals, such as xenobiotics – the metabolites of antibiotics (Cummings & MacFarlane, 1997); training the immune system; preventing growth and invasions of harmful, pathogenic bacteria (Guarner & Malagelada, 2003); and producing hormones to direct the host to store fats.

It is estimated that these gut flora have around a hundred times as many genes in aggregate as there are in the human genome (Qin, Li, Raes, et al., 2010).

Facultative (non-obligate) symbiosis – The organisms can, but do not have to live with the other organism.

- An example of mutual facultative symbiosis is the relationship between the clownfish that dwell among the tentacles of Ritteri sea anemones. The territorial fish protects the anemone from anemone-eating fish, and in turn the stinging tentacles of the anemone protect the clownfish from its predators. A special mucus on the clownfish protects it from the stinging tentacles.
The clownfish feeds on small invertebrates that otherwise have potential to harm the sea anemone, and the fecal matter from the clownfish provides nutrients to the sea anemone.

- The goby fish sometimes lives together with a shrimp. The shrimp digs and cleans up a burrow in the sea bed in which both the shrimp and the goby fish live. The shrimp is almost blind, leaving it vulnerable to predators when above ground. In case of danger the goby fish touches the shrimp with its tail to warn it. When that happens both the shrimp and goby fish quickly retreat into the burrow (Facey, et al. 1997).

Symbiosis may additionally be categorized according to whether one organism lives inside or outside another organism.

Endosymbiosis – one partner lives inside the other. This may occur in several variations:

- One organism may live within the cells of another organism.
  Diverse nitrogen-fixing bacteria live in root nodules on legume roots.
  Single-celled algae live inside reef-building corals.

- One organism may live outside the cells of another organism (extracellularly).
  Bacterial endosymbionts provide essential nutrients to about 10%–15% of insects.
  Symbiodinium live in corals).

Ectosymbiosis (also called exosymbiosis) – the symbiont lives on the body surface of the host.

- Mistletoe is a plant commonly seen growing on trees. It attaches to and penetrates the branches and absorbs water and nutrients from the host plant.
- Ectoparasites such as lice
- Commensal ectosymbionts such as barnacles that attach themselves to the jaws of baleen whales.

Cleaner wrasse

- Mutualist ectosymbionts such as cleaner fish remove parasites from the skins of larger fish, and many birds do the same with various larger animals, including impalas, rhinoceros and cattle. Cleaning behaviour by birds was first described by the Greek historian Herodotus in about 420 BC.

Yellow-billed oxpecker

There is a degree of disagreement in categorizing these relationships, and some scientists may classify as ectosymbionts those organisms living on the inner surface of the digestive tract or in the ducts of [exocrine glands], as the partner is not technically within the tissues of the host.

Symbiosis is also classified by physical attachment of the organisms. Symbiosis in which the organisms have bodily union is called conjunctive symbiosis, and symbiosis in which they are not in union is called disjunctive symbiosis.

Organisms adapt to each other in mutualism and endosymbiosis. During mutualistic symbioses, the host cell lacks some of the nutrients that are provided by the endosymbiont. As a result, the host favors the endosymbiont's growth processes within itself by producing some specialized cells. These cells affect the genetic composition of the host in order to regulate the increasing population of the endosymbionts and ensure that these genetic changes are passed through heredity to the offspring.

Symbiotic commensalism

Commensalism describes a relationship between two living organisms where one benefits and the other is not significantly harmed or helped. Commensal relationships may involve one organism using another for transportation (phoresy) or for housing (inquilinism), or it may also involve one organism using something another created, after its death (metabiosis). Examples of metabiosis are hermit crabs using gastropod shells to protect their bodies and spiders building their webs on plants.

Parasitism (antagonistic or antipathetic symbiosis)

A parasitic relationship is one in which one member of the association benefits while the other is harmed. Parasitic symbioses take several forms:

Endoparasites live within the host's body
Ectoparasites live on the host’s surface.

Biotrophic parasites rely on their host's surviving This is an extremely successful mode of life.

Ticks feed on the blood of their hosts.

Necrotrophic parasites kill their host.

Depending on the definition used, as many as half of all animals have at least one parasitic phase in their life cycles, and it is also frequent in plants and fungi. Moreover, almost all free-living animals are host to one or more types of parasites.

Amensalism

In amensalism, one species is inhibited or completely obliterated and one is unaffected. This type of symbiosis is rarely mentioned in rudimentary reference texts, but is widely found in the natural world.

> A sapling may grow under the shadow of a mature tree. The mature tree can begin to rob the sapling of necessary sunlight and, if the mature tree is very large, it can take up rainwater and deplete soil nutrients. Throughout the process the mature tree is unaffected. If the sapling dies, the mature tree gains nutrients from the decaying sapling. These nutrients become available because of the sapling's decomposition, rather than from the living sapling, which would be a case of parasitism.

Synnecrosis

This is a rare type of symbiosis in which the interaction between species is detrimental to both organisms involved. It is a short-lived condition, as the interaction eventually causes death of both. Because of this, evolution selects against synnecrosis and it is uncommon in nature. The term is rarely used.

Symbiosis and evolution

...I believe the first living cell had echoes of the future in it
And felt direction and the great animals
The deep green forest and whale's track sea.
I believe this globed earth not all by chance and fortune
Brings forth her broods
But feels and chooses.
And the galaxy, the firewheel on which we are pinned
The whirlwind of stars in which our sun is one dust grain
One electron, this giant atom of the universe
Is not blind force
But fulfills its life, and intends its course.

- Robinson Jeffers (De Rerum Virtute)

The evolution of all plants, animals and fungi is believed under the endosymbiotic theory to have resulted from a symbiosis between various sorts of bacteria. It appears quite possible that groups of diverse bacteria found it mutually beneficial to develop symbiotic relationships, each group benefitting from capabilities of other groups that complemented their own capabilities.

Eventually, the symbiosis of separate bacteria evolved into cells that contained elements of the bacteria that were sub-specialized within the cell. This theory is supported by the presence of organelles within cells that appear to be remnants of symbiotic, evolutionary ancestors of these cells. These organelles are parts of the cell with distinctly specialized functions that contribute to the functioning of the cell. Organelles within a cell may divide independently of the replication of the whole cell. In addition, some organelles seem to have their own nucleic acid, which comprises the biological building blocks for genes. Genes contain the blueprints for replication of cells and of whole organisms.

Although symbiosis historically has received less attention than other interactions such as predation or competition, it is increasingly recognized as an important selective force behind evolution, with many species having a long history of interdependent co-evolution.

Human psychological and social symbiosis

Humans are psychologically symbiotic in many ways.

Growth-promoting symbiosis

- Partners living in a mutually nurturing, supportive and loving relationship.
- Children depend on the teachings of their parents to learn how to live independently and survive in the world.
- Parents are dependent on their children to perpetuate their personal, family and cultural wisdom and traditions.
- Parents may become dependent upon their children for support in their old age.
- Parents teach their own children to be supportive of themselves in their old age by demonstrating how they support their own parents (the children's grandparents).
- Elders are repositories for wisdom that can inform, broaden and deepen the understandings of the world of younger humans, saving the younger ones from having to learn lessons that could be costly.
- Employers depend on a work force and workers depend upon employers for their mutual benefits.
- Enlightened governments legislate and support laws that create benefits for members of their population, which in turn support the government.

Growth-retarding symbiosis

- Children may be crippled by over-dependence, remaining symbiotically attached to their parents past the age at which they are able to fend for themselves.
- Parents may perpetuate their children's dependence upon parental support and control out of various psychological needs of the parents (wanting to feel needed, having a purpose in life, or other reasons).
- Employers may exploit their work force, keeping a large portion of the profits and paying as little as possible to the workers.
- Workers may unionize and pressure employers for a larger than viable (to the business) share of the profits.
- Governments may seize powers that grant benefits to the government officials, political party members, or privileged members of society (royalty or monied elites), denying many resources or benefits to the rest of the population.

Interspecies interactive symbiosis

> *The evolutionary unity of humans with all other organisms is the cardinal message of Darwin\s revolution for nature\s most arrogant species.*
>
> - Stephen Jay Gould

There are forms of interspecies mutual dependencies that have not been categorized as symbiosis because the participants do not dwell in or on each other. Nevertheless, these are clearly dependencies in which one or both members benefit from each other.

There is often a mutual symbiosis between animals and the organisms on which they feed.

- Wolves hunt deer, culling the weaker members from the herd. When there are ample numbers of deer, the wolves thrive and their numbers grow. If the wolves kill too many deer, some of the wolves starve, reducing their population. At that point, the deer are able to increase their numbers, and the interactive symbiotic cycles continue.

- Herbivores such as deer and rabbits have similar cycles with the plants that they eat. When the numbers of animals increase and they over-graze in their territories, there is insufficient food to support their population, and their numbers decrease. When that happens, the plants they feed on can grow more numerous. These cycles repeat themselves, too.

There are many forms of animal interspecies interactive symbiosis, some of free choice and some established and imposed by humans.

- Honeyguides or honey birds are found in parts of Africa and Asia. These birds are best known for their interaction with humans. Honeyguides will deliberately lead humans directly to bee colonies, so that the birds can feast on the grubs and beeswax that are left behind after the humans take the honey from the hive (Short, 1991).

- Humans have domesticated numerous animals, some for transportation, others raised for food and animal products such as wool and hides. Farm animal manure is used for fertilizer. The animals benefit from the food and shelter provided by the humans.

- Pets and other animals who interact a lot with humans will often participate in the emotional life of the human(s) with whom they are closely associated. Just as human children will manifest psychological symptoms when their parents are stressed, so will animals display disturbed

behaviors when there is stress in their human families Both the children and the animals draw the attention of the adults to address the stress issues (Chernak, 1999; Diener, 2004; Sheldrake, 1999).

Humans have developed commensal symbiotic relationships with various plants

- Humans rely on crops for survival. Plants that provide food for humans have been cultivated by humans, providing mutual benefits to both species.

- Some plants have been harmed by humans, with over-protection through many generations weakening the plants' abilities to survive on their own. There are natural varieties of corn that will not re-seed themselves because they have adapted to rely on human cultivation.

- The Aztecs protected themselves from detriments to crops due to variations in the weather or blights by planting many different varieties of potatoes. In years of drought, those potatoes that were drought resistant survived; in years of heavy rains, other varieties that thrive in wet environments survived well and provided sustenance. The same applied to other conditions, such as resistance to insects and other pests, keeping qualities in storage, and so on.

Humans in modern society are losing this advantage that is conferred by this variability in plant abilities to withstand diverse environmental conditions. The focus on monocultures, such as just a few varieties of corn and potatoes leaves both the plants and their symbiotic selective cultivators liable to being wiped out if they develop a virulent disease.

- One can also suggest that some plants have enticed and used humans to enable them to flourish and spread far beyond their points of origin and to far exceed their innate abilities to spread and thrive through their own biological capabilities. Michael Pollan (web reference), a journalist, proposes that various plants have been highly successful in spreading all around the world by appealing to the appetites and senses of humans. He focuses on the examples of the apple, which feeds the human desire for sweetness; the tulip, which appeals to human aesthetics; marijuana, which provides pleasure; and the potato, which gives sustenance.

Ecological symbiosis

> *We human beings are meaning-makers, map-makers,*
> *exchanging one map for the next*
> *and wandering within it as if it were not a map but the territory.*
> - Charles Eisenstein (p. 241)

While symbiosis has been conceptualized as the interdependency between reproducing organisms, there are also broader, local and planetary forms of symbiosis. There is always a symbiosis between humans and their environment, but the degree of awareness of mutual interdependence varies with the culture. All humans require the benefits of the land, waters and air for survival, making this a commensal symbiosis at best, but often becoming a parasitic symbiosis.

- Humans have cleared the land of its natural vegetation for farming and have clear-cut forests for wood, mining, building communities and other purposes. The natural vegetation had been symbiotic with the land on which it grew, maintaining the richness of the soil and keeeping the soil from eroding. By removing the natural plant cover and by farming without replenishing chemicals required for plant growth, humans have depleted the soil of its nutrients and removed the soil's protection from erosion. This problem has been documented again and again, leading to collapses

of numerous civilizations. One of the most famous of these is the death of the Easter Islanders, who created amazing, giant statues. Equally amazingly, they cut down every single tree on their island, converting a land that had supported them for generations into an inhospitable environment that led to the collapse of their culture (Diamond, 2005).

- Humans have overpopulated most of the planet. We have exceeded the carrying capacity (ability to support life) of the land and waters, much as over-populating deer and rabbits periodically do on local levels.

- Humans are also polluting the land, waters and air, seriously reducing their carrying capacities further.

- Humans are contributing to carbon emissions at rates that will soon reach a point of no return (if they haven't already done so). As global temperatures rise, methane is being released at accelerating rates from permafrost and the oceans. Global temperatures will increase irreversibly to levels where life as we know it today can no longer be sustained on our planet.

All of these constitute further parasitic symbiosis. In effect, humans as a whole have become parasites, consuming natural resources at much greater rates than they can be replenished. A parasite that consumes its entire host resource cannot survive. While humans maintain the hope that solutions will be found for the dwindling food supplies and environmental issues, many humans, if not all, are likely to perish of starvation and severe climate changes.

Sadly, many other species are disappearing from their natural ranges of habitation and some are going totally extinct due to the parasitic behaviors of humans.

On the milder end of this spectrum, a lack of symbiotic predators can create considerable challenges to the environment. Humans have created serious problems by introducing species from distant lands into new territories where no predators exist to control the numbers of the transplanted species.

- Rabbits were introduced into Australia, where they have no natural predators. They have multiplied to the point of creating an infestation that is highly destructive to plant life. In addition the decimation of plants reduces ground cover and increases soil erosion.

- Giant Asian carp are now displacing all other fish species in some of the Great Lakes.

On the more destructive side of this spectrum, humans are directly killing off so many living organisms directly, as well as polluting the land, waters and air, to the point that thousands of species are being driven to extinction. If we can change our story and get off our self-anointed, falsely exalted myth of being the pinnacle of evolution, we can see that we are horrendous perpetrators who are genociding most other beings on this planet.

How have humans become such destructive parasites?

> *Most people do not see that they are destroying their Earth –*
> *the very planet which gives them Life –*
> *because their actions seek only to enhance their quality of life.*
> *Amazingly, they are not far-sighted enough to observe*
> *that short-term gains can produce long-term losses, and often do –*
> *and will.*
>
> - Neale Donald Walsch

There are many levels of explanations for this escalating, destructive process. The most dangerous parts of human parasitism are those in which we are exceeding the carrying capacities of our land, waters and air to repair themselves from the damages we humans are inflicting. These cannot be repaired readily. There is evidence that these cycles of destruction have been repeated by humans throughout recorded history, from the times when humans developed agriculture and did not replenish the resources of their land, and exceeded the carrying capacities of their available waters (Diamond, 2005).

For most of our existence known, human populations have not exceeded the total carrying capacity of the whole planet. When local resources were exhausted, it was possible for some groups of humans to import needed food and other items or to move on to exploit new territories.

Often, territories that were invaded by groups of humans who were exceeding the carrying capacities of their own lands were inhabited by other humans. In many cases, the local human inhabitants lived in relative harmony with their environments, taking care to avoid exceeding the carrying capacities of their land. The invading humans displaced the local peoples, sometimes brutally murdering them; killing them by introducing fatal infections to which the locals had no immunities; or displacing them from fertile lands and forcing them to live on infertile lands. In these regards, the invading humans can also be classified as parasitic.

With the continuation of these parasitic behaviors, humans are now reaching the maximum carrying capacity of our planet. It is difficult for the average person in the richer countries to absorb or accept this fact. Grocery shelves are still reliably well stocked. Water flows from their taps. There is no scarcity of fuel to run their cars; oil or natural gas to heat their homes; and electricity for light, appliances and air conditioning. Reports of growing starvation in poorer countries are dismissed as “their problems of overpopulation and slower industrial development.”

There is a huge disconnect in the richer countries between the average person and the people who grow their food and who tend to or in other ways influence the conditions of the land, waters and air. With no visible direct connections between people’s behaviors and the deterioration of the land, waters and air, people rely on ‘others’ to address these problems. The others who hold the most influence in these domains are often motivated by short-range self-interests that are destructive to the environment. Businesses hold their companies’ profits as their top priority. Governments are dominated by corporate pressures. Politicians have an event horizon that extends only to the next election, and long-term planning is unpopular in the budget. These are not favorable conditions for re-establishing symbiotic mutualism between humans and their environment!

And there are deeper levels of explorations needed, to answer the most important questions of our times:

1. Why is humanity developing so many ways to suicide collectively, and at the same time genociding most other life on our planet?

2. Why are so few people doing anything to stop this?

My own take on this is that humanity is committing suicide because of a post traumatic stress disorder in the collective consciousness of humanity, of other organisms on this planet, and of our planet herself. For many thousands of years, humans have suffered traumas of diseases, starvation, wars and other lethal violence. There was little choice at these times but to bury the dead, both literally and emotionally, and move on. There were no energies nor psychological understanding of how to release the emotional traumas.

The bad news is that these traumas fester inside people and lead to very destructive behaviors (Clow, 2001). People who are traumatized often become abusers of others. They also become suicidal. These are classical symptoms of post traumatic stress disorders (PTSD). Humans are very obviously exhibiting both of these behaviors. I believe this is due to a PTSD in the collective consciousness of humanity and that this explains our self-destructive march towards collective suicide and our genociding of most other life as we know it on our planet (Benor, 2014).

The good news is that there are now ways to clear these emotional scars, both personally and collectively (Benor, 2008). And there are many people who are waking up and working very hard to heal the inner and outer wounds on our planet (Hedges & Sacco, 2012; Judith, 2006; Macey & Johnstone, 2012; Rifkin, 2009; Wiser.org). We can only hope that enough people will wake up to make a significant contribution to altering our lemming-like march towards the edge of any of several cliffs.

> *If some people forget their past as a way to survive,*
> *other people remember it for the same reason.*
> - Malidoma Patrice Somé

Creating a story with a happier ending

> *When one lets go of the story of the discrete and separate self,*
> *amazing intuitive and perceptual capabilities emerge from lifelong latency.*
> - Charles Eisenstein (p. 239)

Charles Eisenstein is a brilliant, innovative writer on many aspects of these problems. He notes that battling the people who created and perpetuate these problems of human parasitism is usually minimally productive, if at all. In fact, when we adopt confrontive and coercive methods for bringing about changes, we often generate more resistance to change, achieving the opposite of our intentions and dissipating our healing energies.

Eisenstein observes that we all live our lives with the guidance of stories that explain the world and tell us what our place is in the scheme of things. We have personal stories, family stories, religious stories and stories from our general cultural. Whenever major cultural changes have come about, it has been through adopting a new story that defines our world and our relationships within that world in new ways.

Eisenstein notes that one of the most destructive stories of our time is the myth that humans are separate from the rest of our world. I would say that this story of separateness is even more pernicious than Eisenstein states. Built on arrogant human beliefs that we are superior to all other life forms, our story gives us license to manipulate and exploit all other life on this planet, and the resources of land, water and air as well. Even worse, many religions teach the story that humans in general, and particularly those of the faiths preaching this story, are the chosen ones who have been given dominion over all of creation.

Eisenstein addresses in wonderful detail the need for leaving these old stories of separation behind and for developing a story of “interbeing.”

> …In its personal expression, it [interbeing] proclaims our deep interdependency on other beings, not only for the sake of surviving but also even to exist. It knows that my being is more for your being. In its collective expression, the new story says the same thing about humanity’s role on

> Earth and relationship to the rest of nature. It is this story that unites us across so many areas of activism and healing. The more we act from it, the better able we are to create a world that reflects it. The more we act from Separation, the more we helplessly create more of that, too. (p. 20-21)

I see the prevalent old story as one of humans having dominion over the rest of the world. Eisenstein focuses primarily on people not accepting other people and needing to develop a new story of supporting each other, though he does briefly mention the broader need for a story of oneness with all other living beings.

And there is further important step. I see the more serious challenge as one of people needing to accept all of the other living beings as full partners in our life on earth. In the current prevalent story, plants and animals are said to be here to satisfy human needs. The needs of the plants and animals are generally not considered, outside of their minimal needs for physical conditions to survive – including nutrients from the soil, water and sunlight – for the adequate growth of plants, to provide food and materials for the benefits of humans; and for providing food, labor and animal parts for human consumption.

The innate rights of other living beings to have their needs and wishes honored and respected are so far outside the prevalent current world stories as to be non-existent for most people. Yet there are increasing numbers of people strongly advocating for the rights of all animals and plants. Some endangered species are being identified and protected. And increasing numbers of humans are advocating for the development and enhancement of considerate and respectful relationships with animals.

Gradually, more and more people are developing communications with animals and plants, reporting that they are intelligent and wise beings. These reports are usually dismissed by those wedded to the current prevalent story as wishful fairy tales or the products of deranged minds. But even some of the media are beginning to acknowledge the story of interbeing. The hugely popular film, Avatar, is an example of this shift.

And the waters and the land and the air are needing our communications and support as well. They are alive and conscious. Peoples through the ages who have lived close to nature acknowledge the spirits of the land that gives sustenance to those who dwell upon her; of rocks and mountains and their energies and wisdom that they can share with those beings who grow and who walk upon them; and the spirit of the entire planet, our Mother Earth, as a living, sentient entity. These people speak with the spirits of water and wind and earth, asking for their blessings and help, and thanking them for their assistance in bringing into being and supporting all of the life forms in this world, including humans. These are not new awarenesses. Studies of indigenous peoples around the world find that these are by far the more prevalent stories about the world and the place of humans in the web of life. And these are stories that I and others are accessing through direct experiences. And they are marvelously healing!

So the question I invite you to ponder with me is: How can we waken people to the old, but forgotten – and therefore to them a new story – of our oneness with the plants and animals, the air and waters and land, and to Gaia, our Mother Earth herself?

I believe that here, as in many lessons, starting from the smallest pieces and building to the larger ones may be an easier way for people to absorb a new story that can replace the destructive stories of separation. If we can accept that we are in a symbiotic relationship with the microorganisms living in and on our bodies, building a true story of interbeing within ourselves, it will be easier for us to accept our symbiosis with other living beings.

Practical steps towards awareness of interbeing

> *I feel such a sense of solidarity with all living things*
> *that it does not matter to me where the individual begins and ends.*
> - Albert Einstein

There are countless ways in which humans can live more harmoniously with our outer world. For instance, in a very engaging Ted Talk, Michael Pawlyn "describes three habits of nature that could transform architecture and society: radical resource efficiency, closed loops, and drawing energy from the sun" (Pawlin, Web reference). These sorts of initiatives are stimulated through awareness of the benefits through our participations in mutual symbiotic relationships with other living beings and with our planet herself.

Our inner worlds may also benefit through enhancing our interbeing relationships. What better place to start than to communicate with our resident, symbiotic microbes? While you may consider this a far stretch, there are indications that this is not only possible but entirely feasible.

I have been exploring the nature of the bacterial-human symbiosis with the help of highly gifted intuitives. These are people who can connect with the consciousness of others. Some intuitives are particularly sensitive to connecting with humans; others with animals, and some with other living beings as well.

Their most common calling is to help people identify the factors contributing to their medical and psychological conditions, when these have been missed by their doctors and other conventional therapists. For instance, arthritis may be identified as a manifestation of Lyme disease; pains may be explained as symptoms of unidentified cancers or as psychological symptoms, and the specific causes may be described by the intuitives; chronic fatigue may be explained by intuitives' identification of a thyroid disorder, emotional issues; and so on. When asked how this is possible, the intuitives generally respond with explanations such as telepathy, sensitivity to the biological energy fields of people, or tapping into the collective consciousness that links all awareness – anywhere and everywhere. By asking for the relevant information, with the consent of the person seeking to understand their condition, the medical intuitives receive the answers as words, images or other sensory awarenesses.

Conventional medicine and psychotherapy have generally ignored or dismissed medical intuitives as charlatans, but there have been several investigations that confirmed their abilities. The most impressive was published by C. Norman Shealy, a neurosurgeon who has been a leader in the development of the American Holistic Medical Association, studied the abilities of Carolyn Myss, a medical intuitive. Given only the names of patients of Dr. Shealy, she was able to correctly identify their known (to Dr. Shealy) medical conditions in 93 out of 100 cases (Shealy, 1975; 1988; summarized in Benor, 2002).

Other intuitives help to identify causes of illness in animals and plants. Dowsers are intuitives who can locate sources of underground water for wells, or can locate valuable minerals underground. Many intuitives say it is just a matter of asking a question and opening to their inner awareness for answers.

I have explored the abilities of a broad spectrum of intuitives, both personally and clinically. I have focused particularly on those who are sensitive to medical and psychological problems (Benor and Mohr, 1986), and am impressed that there are, indeed, gifted people who have these abilities. Some are born with these gifts; others develop them spontaneously or through studies of complementary therapies such as Therapeutic Touch, Healing Touch, Craniosacral Therapy, and other modalities.

So far, I have found only a few, highly sensitive medical intuitives who have connected deeply with the consciousness of microbes. This may be partly due to the more highly developed innate intuitive gifts of these particular people. However, I suspect that the rarity of such awarenesses may also be due partly to the fact that medical intuitives have not focused their attentions on such communications, rather than that they are unable to do so.

Here are some early impressions from these explorations:

There are bacteria resident in the intestines of humans, present from the birth of the human. They hold a place in the interface between their human host and the substances passing through the gut. They prevent imbalances or invasions of bacteria, yeasts and other microorganisms that could cause diseases. Members of each species of microbe live as a collective community within that individual.

There are additional probiotic bacteria that are also present at birth. These are particularly sensitive to antibiotics and are easily decimated when people take antibiotics for infections in any part of the body (not necessarily in the gut). Their populations can be replenished by taking probiotic capsules. They have their own collective personality, being much more outgoing and curious about the world outside the human they inhabit.

Our resident bacteria help support humans by populating the intestines and holding a healthy space so that invading microbes do not find a ready place to settle in and multiply.

Our symbiotic intestinal bacteria prefer an alkaline environment.

The above is the ‘what’ of communicating with our symbiotic partners. Here’s some of the ‘how’ of it.

The resident bacteria in a human are totally devoted to supporting and promoting the health and wellbeing of their individual human host. In the majority of humans (limited to conventional, sensory world awarenesses), they accept that their host is not able to connect consciously with his or her own symbiotic microbial community. When contacted by medical intuitives the microbes are surprised and pleased to communicate with these humans and to have the intuitives discuss the state of their host human, even though the host has no direct awareness of the conversation.

The resident bacteria tend to be narrowly focused on their host human and are generally not aware of other human symbiotic bacterial communities.

While resident microbes have the capacity to connect with each other through a species-specific microbial collective consciousness, they generally focus rather narrowly on the complex tasks of supporting their human host.

Microbes that are parasitic, causing diseases, view humans (and other host animals) matter-of-factly as habitats in which they can live. They are insensitive to whether their hosts survive or not.

I believe that expanded dialogues of these sorts would help humans to find new, more healing stories for guiding our lives. Consider:

- What more healthy, healing worldviews might develop if more humans communicated with their microbial symbiotes?

- What if humans as a whole acknowledged their symbiotic relationships with their resident microbes?

- What if our symbiotic microbes developed more awareness and communications with other resident communities of human microbes? Might they also help us to develop and deepen our intuitive awarenesses of and empathy for other people?

- Same question for microbes connecting us with other animals, plants and other species?

- What if humans accept the story that we are part of a greater, collective living ecological interbeing that includes all other life on our planet?

- What if we include Mother Earth as a part of this living ecosystem in our new story?

In summary

The true healing…means coming into resonance with the Creator's one law:
You shall be in good relationship with each other and with all things in the Great Circle of Life.
- Brooke Medicine Eagle

I hope this story about stories can open doorways to new ways of understanding and working with our planet and every conscious being upon our planet.

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