

MORNING EARTH

Yearning to be Round

A Primer in Ecological Concepts in 16 Parts

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16. Edges, Where the (Inter)Action Is



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Living systems have boundaries. Living organisms are open systems in the sense that they take and excrete energy and matter. ... but they are also enclosed within ... internal boundaries. As we move in towards the Earth from space, first we see the atmospheric boundary that encloses Gaia; then the borders of an ecosystem such as the forests; then the skin or bark of living animals and plants; further in are the cell membranes; and finally the nucleus of the cell and its DNA.

— James Lovelock, *The Ages of Gaia*

EDGE AND INTERFACE

If you solve jigsaw puzzles, you know that a smart way to begin is to find the edges, the straight sided pieces that are the borders and boundaries of the picture.

Exploring the idea of **Edges** may help us solve some puzzles of Nature, and may give us some insight into our own natures as well.

Lovelock speaks above of boundaries. “Boundaries” in common thought have to do with control. We usually think of boundaries as ways to mark what is ours, or ways to keep things out—or keep things in.

But in nature, boundaries are the places where things connect. Boundaries are Edges, where things face each other, push against each other, and sometimes blend into each other.

The places where things connect are exciting, because we don't know what will happen there. Instead of control, Nature's edges offer us potential. Where things connect is where the action is; where the interaction is.

Cousin to Edge is the concept of Interface.

An Interface is a place or process where things join, or connect to each other.

The cable between a printer and a computer interfaces them. An Interface is sometimes a surface forming the common boundary between adjacent solids, spaces, etc. So an interface is a kind of boundary. Like a boundary, an interface is an edge between differences.

An example of an interface in nature is the surface of a pond, where air and water meet. Another is the leaf-litter on the forest floor, where soil meets atmosphere and humus is created in the crucible of decay. Both are rich, incredibly active edges where energy-transfer is continuous.

Consider the whole idea of **edge**. The word has several meanings: border, brim, entrance, margin, threshold, limit, frontier, borderline.

Above all, in ecology edges are places where things join, where things intersect, where things interface—and where the interaction is.

Boundaries, I noted, often have to do with closing things in, marking the ends or limits of things, such as property lines.

We can more usefully think of edges as beginnings rather than endings; as thresholds, doorways, as entrances and openings.

We can recognize many kinds of edges and interfaces.

Consider Interfaces in Time, or Temporal Edges

-  Edges between Autumn/Winter and Winter/Spring
-  Regard a fossil as a wide temporal interface
-  A doll or book from your childhood discovered in your mother's attic is a temporal interface of great power
-  An arrowhead, picked up in a field, is a temporal interface that makes you wonder who held it once, and where it's been



The ambush of a sudden scent becomes a time machine

Conceive of "turning moments" in your life as interfaces in Time.

Think about edges between life and death. Mountain climbers and adventurers of all sorts describe how sometimes being "on the edge" enhances their joy in life. Fear can brighten the colors. (The philosopher Martin Heidegger saw life as existing on the edge between Being and Nothingness.)

Think of the decomposers—the fungi, the bacteria, etc.—as creatures of the edge between life and death. They are the crucial recyclers of energy and nutrients.

Edges in Natural Ecology: Ecotones

In Nature (which includes us) edges are where the action is. Edges are where the energy is high, where the energy is most richly organized by life. Edges are where the energy is gathered and exchanged.

When we attend to the connections living things make at the edges, we wake to Nature at its most exciting.

In ecology, the **transitional zone between communities** is called an **ecotone**. What is interesting about that is not only that a transitional zone means a "blurry" edge, but that the word ecotone comes from *eco*—life and *tonus*—tension.

Ecotone means *place of life-tension*.

A beautifully accurate word. The edge effect in ecology names the general truth that at the ecotones you will find the greatest species diversity and the most biological density. More growing, more hunting, more eating, more energy!

Where large ecosystems interface, we find the greatest number of species.

In North central Minnesota, three great systems rub edges: the boreal forest of the Northeast (evergreen taiga); the Big Woods and its remnants (deciduous forest); and the prairie (grasslands).

These biomes interpenetrate each other. Maple/basswood forest is interrupted here and there by a prairie intrusion. Prairie is interrupted by pine-covered hills, and patches of boreal-forest biome muskeg turn up where you expect a cattail marsh. Animal species from all three ecologies abound.

Mind Experiment: A great tree falls. A small forest clearing results. It is a new interface between forest and not-forest. The clearing is suffused with light; the result is a broad diversity of plants using many strategies to gather light. to grow and make seed.

Some pioneer plants grow best on newly disturbed ground. The goosefoots and milkweeds and mulleins will likely show up in our clearing. Some forest plants shrink away from bright edges—too much light, too much heat on shallow roots. They are adapted to shade.

Some plants, such as blackberries, take on new energy on bright edges and grow rambunctiously. They are adapted to opportunity. Some tree

seedlings have their first opportunity to come out of the parental shadow and grow, so they colonize the clearing and, with the understory bushes, begin to return it to forest.

Nature has its Temporal edges: Look at edges between day and night—sunrise and sunset—the powerful energy of dusk and daybreak, when the frogs sing at dusk while humans sink toward dream, when the birds sing at dawn while we swim up from dream, when many animals are most active in feeding (they are called ‘crepuscular’ or twilight feeders). Twilight/dawn feeders such as cottontail rabbits, woodchucks and browsing deer enrich our moments.

We see life’s richness at edges where water meets air, such as the surface of a pond or marsh; insects fly everywhere, with swallows swooping down on them from the sky, fish jumping up at them from the water, the kingfisher and tern diving from air into water after the fish, while evaporation lifts the water into the sky.

Living things are always dashing across the edges, and, with luck, they dash back again to home. Edges are where much feeding or energy exchange occurs.

Where landscape has been extensively altered by humans (most everywhere) we find important interfaces between the wild and the tamed, such as windbreaks, hedgerows and fencerows. These places provide invaluable breeding/feeding habitat for many species, and provide wildlife corridors which allow for animals' foraging and travel.

If we look at aerial photographs, we see revealed landforms which create a pattern of topographic edges. River is edge. A rocky ridge or edge in the center of a watershed is called a divide. “Treeline” on a mountain is a

vertical edge—between altitudes, hence between microclimates. As one moves North across Canada, treeline marks the edge between the boreal forest and the tundra.

Edges inside Us

Boundaries, I noted above, often have to do with closing things in, marking the ends or limits of things. We can more usefully think of edges in our lives as beginnings rather than endings; as thresholds, doorways, as entrances and openings.

The place where each of us “interfaces” with the world is our skin—the boundary, or edge, between our selves and the rest of the earth. The skin is a semi-permeable membrane rather than an impervious barrier; human skin is a blurry edge, not a hard edge as in our ordinary thinking. Healers have always known this; we have been using poultices since time began. The earth blurs into us through the skin and the soft membranes of the nose and tongue

But maybe it is not the skin or hide that is the interface. One aspect of territoriality and communication in many animals (including us) is the **bubble of personal space** surrounding us. Look at starlings sitting on a wire; they are spaced equidistantly. One moving closer would be an intruder, and harshly dealt with. Among humans, the size and nature of our personal space are culturally determined. When people get too close, we don't feel comfortable.

There are some edges we are biologically predisposed to pay attention to. Our eyes are programmed to notice edges, or contrasts, in the visual field. We notice the ‘edge’ features in our field of view, and anything that interrupts our expectation is an edge we must pay attention to. This is the legacy of being both hunter and prey.

Similarly, in the absence of light, our tactile sense is especially attuned to textural interfaces. If you lean back from the campfire and your hand meets fur instead of sand, it gets your attention. So some kinds of edge are part of our perceptual endowment.

The interior landscape has its temporal edges, too. The daily interfaces between sleep and waking are central to our lives.

The inner human ecology includes such **modes of consciousness** as dream; reverie; the meditative state; linear thought; and creative fire.

Each mode of consciousness interfaces and blurs into the next state, and these are edges to be attentive to. The rise from dreamstate into waking is as experientially rich and energy-filled as any other natural interface.

Just as the outer ecology is filled with change and transformations, so is the human interior.

We continually transform inside from one thing to another. One moment child, the next lover, the next mother, the next wise woman.

As we mature and watch our bodies and roles transform we discover that each successive transformation contains all of the previous ones—so that at any moment the mother may shift inside into child, or lover, or Mom, and so forth. Reverie and dreamstate are by their nature places where we transform, often into the younger self.

In the dreamstate, archetypes at times ‘take us over,’ and we become Bear, or Hero, or Trickster or Fool.

The concepts of interface and edge become most metaphorically

powerful when we look at the creative act.

Psychology speaks of perceptual sets, cognitive filters, or frames of reference through which we process our experience.

When we create, we are often engaged in interfacing previously unconnected frames of reference. Metaphor and most other figures are the result of the unexpected collision or interfacing of two frames of reference in the creator's mind; When you suddenly "get" a joke, or when you are "struck" by a metaphor, you are reproducing one of these collisions in your own mind.

Imagine for a moment that these perceptual filters are eyeglass lenses, each a different color. Now imagine that you lay one lens atop another and lift them to one eye and look through both lenses at the same time. You are experiencing analogical or metaphorical thinking.

Edges in Communal Human Ecology

Consider the edges between human ecology and the natural ecology. Some examples:



the edge of town, between country and city



the edge between grass blade and mower



the long edges where a river passes through a town



the edge between drainage ditch and field



the edge between ship's wake and ocean

-  the edge between woods and road
-  the edge between window screen and mosquito
-  the interface of flower and pollinating bee
-  the interfaces among seed, soil and the planter's hand
-  the interface of sail and wind

We said above that in Nature, the greatest energy and activity is at the edges between habitats.

This 'edge energy' is analogous to what happens when people act cooperatively.

The energy and action is most powerful when we play off each other, build on each other's ideas. When we connect, energy and action result. When we connect, synergy (*where the combination yields more than the sum of its parts*) results.

When we combine this way, Community results.

The concept of edge gives us a novel way to regard Nature's joyful inventions of symbiosis.. As we have learned, symbiosis results when organisms merge and give up their physical boundaries.

In certain animal relationships, a behavioral form of interliving occurs., for example when the oxpecker cleans insects from the hides of grazing herd animals, or the crocodile's teeth are scoured by another bird.

Coral reef animals exhibit many examples of behavioral interliving, as for

example when certain shrimp set up “cleaning stations” for fish.

A similar Natural invention is altruism. When biologists speak of altruism, they speak about ways that animals interact which benefit others, but not obviously the self.

For example, among bluejays, the young are fed by not only the parents but also by aunts and uncles. Primates groom one another, removing parasites. In altruism, as in behavioral interliving, the boundaries relinquished by organisms are behavioral rather than physical.

Some Sources for Edges

Lopez, Barry, *Arctic Dreams*

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