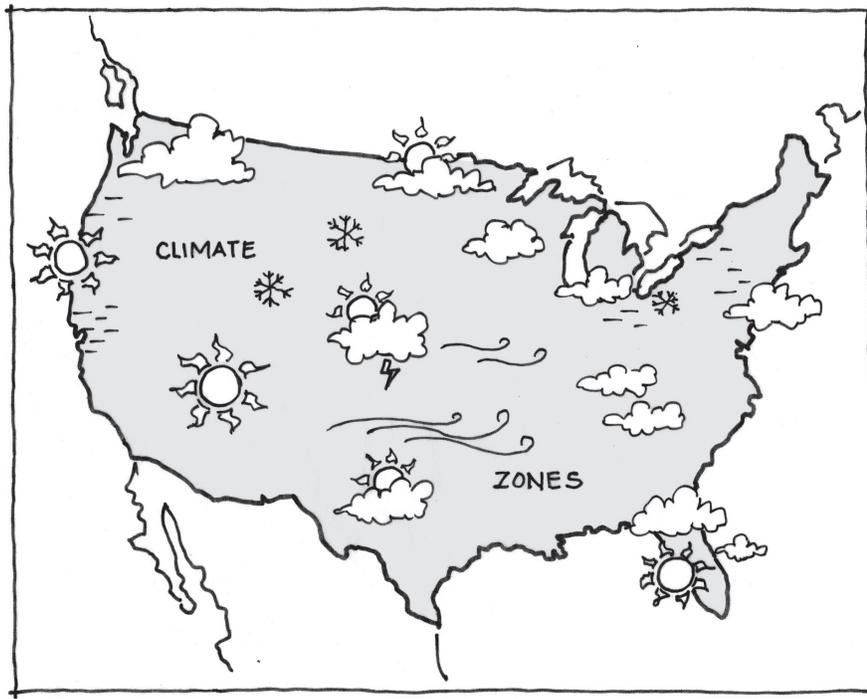


2 Learning the Earth Language



Letting the earth speak to us through climate.

Using Earth's Natural Systems as a Language

The earth is a great communicator. The way it communicates is eloquent. Regardless of whether we are listening or not, the earth is continually speaking to us in persuasive, powerful discourse.

“There is a language beyond human language, an elemental language, one that arises from the land itself.”

—LINDA HOGAN,
CHICKASAW WRITER¹

Humans like Abraham Lincoln have been called great communicators due to the power and beauty of their language. Likewise, the earth speaks a powerful and beautiful language, and, like other great communicators, the earth uses its language to share with us what it knows and what it values.

If we think about the way Earth's natural systems work, we realize that they are not confined within the boundaries humans have defined. One of our consultants, Dave Wolverton of Mediawerx, did a comprehensive study of early exploration and development of the American West. Dave's research led him to explorer John Wesley Powell (for whom Lake Powell was named), and what Powell wanted to do. Observing the natural lay of the land in the West, Powell proposed that state and other territorial boundaries should be based on drainage basins. This remarkable vision of the future resulted from Powell's seeing the extreme water scarcity in the West and recognizing how important the control of water was going to be. He realized that it would be easier to manage territories if natural drainage basins were regulated by people who actually lived in those basins.

When we use the term *earth language*, we mean letting the earth "speak" to us in the same way John Wesley Powell let it speak to him. Of course, *language* is used metaphorically here. In this same metaphorical sense, we propose a design "language" for America's built environment that expresses Earth's natural systems.

As each of us who is seeking symbiosis returns to living in alignment with the earth and learns the art and craft of building, we will be able to use this earth language in our daily lives. Remember, though, that within the one overarching earth language, there are many, many local

"dialects." The earth language we speak at any particular time will be based on our specific location at that time. Every specific place on the earth talks to us in its own variation of the earth language.

The earth speaks with great expressiveness and poetry. When we listen, we can hear it, grasp the nuances, and understand it. If we don't listen, the earth goes unheard. Not listening to the earth has generated many of the tragedies facing us in the natural world today.

The structure of earth's language arises from the structures inherent in natural resources and from the natural systems in which those resources function. Nearly every material thing can be comprehended by people who have chosen to learn how to understand the earth language.

Early humans identified four basic elements: earth, air, fire, and water. These elements represented categories in an earth language that indigenous peoples "heard" in their locales. If we stop and listen, we too will hear the earth tell us how it works: how the structures of natural systems come together to create, define, and sustain a microclimate or local environment.

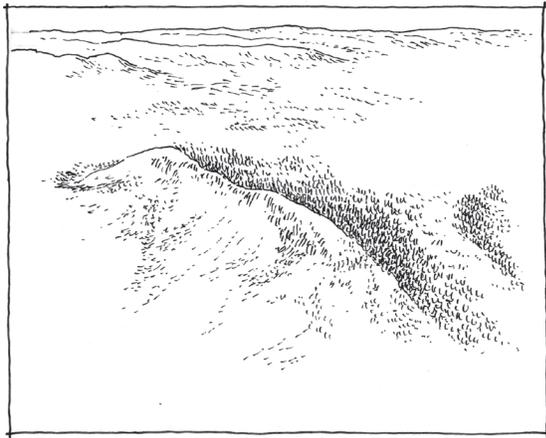
The ABCs of the earth language begin with understanding our immediate environment and microclimate. Do I live in a forest or on a great plain? How much rainfall is there? Where are the drainage basins, creeks, and rivers? What is the seasonal temperature? How much sun is there? How much wind? What are the topography and geology? What plant and animal species are here, and how do they survive and thrive?

Once these and similar questions are answered, we can begin to communicate with the natural systems supporting life in a particular locale. We ask ourselves: How can I express what I want to do in the language of this place?

How can I work with these systems to sustain a dwelling, a neighborhood, or a community here in this place? Our goal is always to speak the native dialect of a locale.

What Is the Earth Language Saying?

We need to understand how the earth language speaks to us, and what it's saying. For insight, let's consider an interesting geological formation called Raspberry Butte.



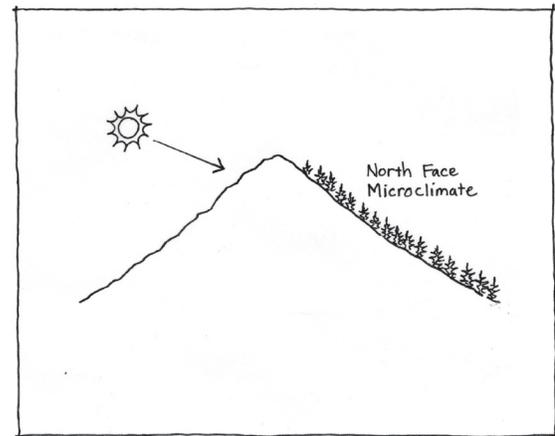
The east–west ridgeline of Raspberry Butte was formed under climatic impact.

By studying the effects of weathering and erosion on this mountain formation just south of Larkspur, Colorado—between Monument and Castle Rock—we can grasp the power of the natural systems present and dominant in this particular locale. Located on the west side of Interstate 25, this butte can be found on U.S. Geological Survey maps and can be viewed in Google Earth by entering Raspberry Butte, Larkspur.

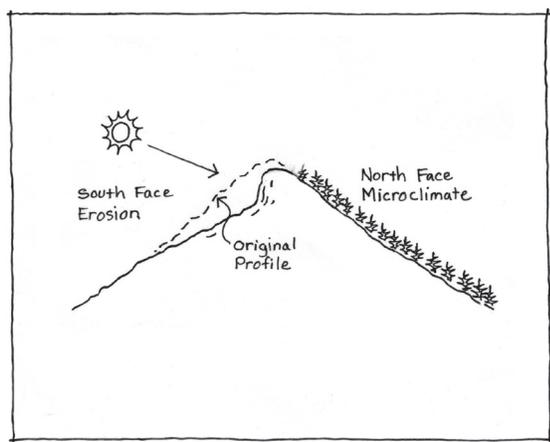
Taking a very close look at this small peak, we see that the north face and the south face are very different. The

north face is covered with a dense growth of evergreen trees, predominantly Douglas fir. The trees are closely spaced and the land is relatively smooth. Looking at the south face, however, we see it covered with grasses and gnarly, low-growing shrubs, such as scrub oak. Instead of being smooth like the north face, the south face has exposed, jagged, crumbling rock faces. Some of the rock has broken apart and started to slide down the hill, so there is a rock-source area at the top of the peak and a rock-fallout area below it.

What may be most interesting—and where the earth language is most evident—appears when we observe this mountain from above or in a plan view. If we were to draw a line separating the different types of vegetation and different textures of rock, it would fall along an almost perfect east–west axis. The line would literally have one end pointing east and the other end pointing west. The rock-fallout area, which is south facing, is located south of this east–west line.



Original peak was subjected to climatic forces.



Today we see the changes caused by climate.

All around us we see evidence that this specific location in Colorado is speaking volumes to us in the earth language. But what is it really saying?

First, the language tells us that the sun is extremely intense in this particular location. It is also telling about dramatic swings in temperature during a typical 24-hour period, especially in winter. This is “spoken” in the way the rock is broken into small pieces. The sun is extremely intense in wintertime when the sun is low in the sky and its rays more directly contact the sloping rock face. The sun heats the rock during the day, melting snow and ice. At night the remaining water refreezes. This powerful freeze-thaw cycle is actually strong enough to break the granite rock apart—a graphic demonstration of the tremendous power of the sun.

The opposite exposure on the north-facing slope is another world. Because the sun is low in the sky during winter, the land here is in shadow and not subjected to freeze-thaw cycles. Topsoil has been deposited here, and snows stay on the ground longer, providing moisture for

the trees. Because of these conditions, trees thrive here. By observing the vegetation, the shadow areas, and the way rain or snow falls and flows or remains, we see how this piece of land expresses the earth language.

We need to listen to what the earth is saying when we plan any building in this or any other specific locale. If we build near Raspberry Butte, our planning would begin with the preferred orientation of the building and the selection of exterior materials. We would build along the east–west axis so the longest wall would face south. Windows would be placed primarily along the south of the building; hence, the glass would be shaded during the summer, but sun could reach into interiors during the winter.

In selecting exterior materials for the south wall, we would choose those that tolerate extreme swings in temperature. Using metal wall panels on the south-facing side, for example, would most likely be a poor choice. Metals have a very high coefficient of expansion, which means they expand dramatically when heated and contract when cooled. Anyone who has ever been in an old barn has probably experienced this. On a hot summer day, when a cloud passes in front of the sun, a metal roof makes a popping sound. This is the sound of the metal contracting—actually shrinking in size.

But we are building at Raspberry Butte. If we use metal panels on the south side requiring screws or some other type of mechanical fastener, they will be subjected to extreme contraction movement and are likely to fail. In the same way that the rock has broken apart over time, the earth language tells us that the intense sun and drastic temperature swings would favor another material, masonry perhaps. Whatever material is ultimately used, it must accommodate the natural cycles of thermal expansion.

When orienting a building, shouldn't our east-west line face more east than south, like Michael Reynolds's earthships? We see Michael Reynolds, like many Native Americans, as a master of the earth language. In his earthships near Taos, New Mexico—located at Highway 64 and Earthship Way—he has oriented his south-facing façades so that they are actually about 24 degrees north of due east and south of due west. What may have prompted this is a condition called *thermal lag*.

A good example of thermal lag is boiling a pot of water. When a pot of water is placed on a burner and heat is supplied, there is a lag time between when the energy is applied and when the water boils. Once the water gets hot and the burner is turned off—the heat energy is removed—the water stays hot for a while. The time differential between applying the heat and the water getting hot, as well as the time differential between turning off the heat and the water cooling down again, constitutes the thermal lag.

Thermal lag occurs in nature when the sun rises and begins to heat up materials, just like when sun shines through our car windows and heats the car interior, or when it shines through windows of our homes and heats up the rooms inside. It takes time for things inside to be heated by the sun—this is the lag time. This phenomenon favors shifting a south-facing façade slightly to the east in order to offset the lag time and allow a building to heat up sooner. The same idea applies to shading for summer months as well. The intense afternoon summer sun is shaded more efficiently when the south-facing walls have a slight easterly orientation. This is what Reynolds has done in his earthship. It is the result of a keen understanding of what the earth language is saying.

Key Role of Systems Thinking

When we try to pick out anything by itself, we find it hitched to everything else in the universe.

—John Muir²

Unlike early indigenous peoples, who deeply understood their world as one interconnected whole, we live in a culture that thrives on fragmentation and disconnection. Although we sometimes pay lip service to wholeness, our genuine faith in the interconnectedness of all things has been lost. We've literally lost our connections. We see the parts rather than the whole. Over and over, we try to break things down into pieces we can understand and then control, rather than submit to alignment with the big patterns in life.

Our addiction to control and domination of nature means we continually choose to view life through a shattered lens. Life is not a million tiny, separate pieces; it is a gigantic interconnected web that includes everything real. Whether we see it happening or not, everything affects everything. Living in an interwoven matrix as we do is exactly what it means to live in a system. When we tinker with the parts, we are affecting the whole system, whether we know it or not.

For centuries, Western civilization, unlike many older indigenous cultures, has failed to look at the cosmos, the planet (all life on the planet), nature, and human beings as interactive elements in one vast system. Spiritual masters have repeatedly told us that everything is interconnected. Spiritual parables remind us that everyone is our neighbor, that we are connected to everyone and everything in some way. But we keep choosing to ignore that fact. Sci-

ence, with its emphasis on analysis of parts and separation of disciplines, has helped us to ignore it.

As we focus intensely on the parts, we often fail to even consider exactly how things relate to one another. If our system includes negative dependencies rather than relationships of mutual benefit, then the parasitic parts will continually put a drain on the whole system. The level of functioning will be lower. The system will become sick. It may continue to function, but it won't be working at its optimum potential.

We are so slow to learn. Even as the earth's system is being dragged down by our behavior, we keep trying to manipulate the planet to force it to meet our selfish wants. We carelessly plow ahead, living for the moment. We push the earth beyond its natural balance. All our frantic self-absorbed activity helps us deny what our hearts are telling us: that to survive, we must work *with* the earth rather than insisting that we can manipulate and control it.

We need to reverse our viewpoint and converse with the earth. This conversation begins by truly seeing what is occurring around us. One way we begin to see how to interface our human creations with the earth's systems is by exploring the seasonal cycle of a particular place: a forest or a great plain, for example. We can look deep into how each season affects the plant and animal species. As we identify individual systems at work around a plant or an animal, we can trace how these systems work together in balance. As we keep putting the pieces together—seeing how they are interconnected rather than separate—we begin to grasp the complete system of a place.

The local microclimate where we live—the rainfall, sun, wind, geology, and other natural systems in that pinpointed area—dramatically affects the plant and animal

life in our local world. By pulling together the interrelated impacts of these cycles on what already naturally lives there, we can anticipate how the local climate will affect anything new that we build, and vice versa.

Linguists tell us that language structures are embedded deep in the brain. Our acts of outward expression in the built environment should be so deeply engrained in an earth-language consciousness that our alignment with nature is intuitive. Understanding the natural system in our locale has to become an innate part of who we are. The local resident, the local designer, and the local builder must all be fluent speakers of the earth's language and know its local dialects well. Then we can "write it down" for all of us to see through our built forms.

The earth's language naturally speaks in categories of interconnection. We may have heard the example of a butterfly flapping its wings in the Brazilian jungle, and how the effects of that small act will ultimately be felt all over the planet. So, to effectively converse with the earth, we must approach it as an interlinked system full of mysterious and delicate connections.

Systems thinking is a discipline that can help us understand what is occurring. It emphasizes the relationships among parts in a system, rather than focusing on the individual parts themselves. Traditionally, empirical science has obtained knowledge by breaking a thing down into its parts, and then breaking down each part into its constituent elements. This analytic approach has served Western culture well in many ways. But system dynamics shows us that it is equally essential—indeed, critical—to understand the relationships existing among those parts. We must see exactly how the parts fit together and how they mutually affect each other.

A system is not necessarily some enormously complex thing. A *system* is any set of interrelated elements that make up a unified whole. Even a recipe for an entrée is a simple system. As we well know, every ingredient has to be connected together in exactly the right way to be truly delicious. Plants, individual people, families, schools, watersheds, or economies—all are systems. At the same time, each one is part of the larger systems in which they exist.

In our scientific-analytic approach to the earth, we have tended not only to break the planet down into parts—water, climate, air, land, and so on—but also, and equally disastrously, to manage and manipulate each part separately. This has led to skewing or disrupting the relationships in the system(s) and sometimes literally destroying some of the earth's systems completely.

It is doubtful that we can save our planet without a systems approach to preserving it. Systems thinking gives us the methodology to think in terms of relationships, connectedness, and context. Furthermore, it's virtually impossible to understand the concept of sustainability and what is required to sustain a system like the earth without being schooled in this way of thinking.

Happily, practicing symbiosis is exactly the “school” we need. Symbiosis shows us the principles of systems thinking and then guides us into using these on a daily basis. Symbiosis is systems thinking at its best: It is aimed at creating a closed loop, which is a fully realized form of system.

We'll recognize the environmental, functional, and cultural components of symbiosis, as found at Ivywild, in the following definition of a system and its feedback loops set forth in “What Is System Dynamics”:

In its simplest sense system dynamics focuses on the flow of feedback (information that is transmitted and returned) that occurs throughout the parts of a system—and how the system behaves as a result of those flows. For example, system dynamicists study reinforcing processes—feedback flows that generate exponential growth or collapse—and balancing processes—feedback flows that help a system maintain stability.

These reinforcing and balancing processes aren't mysterious . . . they're all around us and within us. . . . Our bodies' ability to maintain a basic temperature of 98.6 degrees Fahrenheit, the stability that emerges in predator/prey systems, and the difficulties when we try to change the way an organization does things, are all examples of balancing cycles.³

In the case study, you will easily see how the feedback systems of symbiosis, including the byproduct sharing of functional symbiosis used in Ivywild, are prime examples of system dynamics.

Understanding Native American Language—Thinking like an Indian

A healthy and respectful earth language for the United States has roots in indigenous cultures that inhabited

North America, especially the Western regions. Native Americans clearly realize that they have historically spoken a language significantly different from the language of the white race in how it conceives the earth. As Lakota Sioux elder and medicine man Native American philosopher John (Fire) Lame Deer wrote:

According to our [American] definition of a good education, students are trained to think analytically. In Native American culture, by contrast, they study the interconnections of the entire ecosystem. “Seeing in a sacred manner” means perceiving interspecies links. The word for “prayer” in Lakota is wocekiye (woh-CHAY-kee-yay), which means “to claim relationship with” or “to seek connection to.”

To the Lakota people, the cosmos is one family. To live well within the cosmos, one must assume responsibility for everything with which one shares the universe. There are familial obligations towards water, plants, minerals. Any harm done to the slightest of these relatives has devastating consequences on the whole ecosystem.⁴

Because Native Americans lived on the land, they were reminded on a daily basis that the earth provided for their survival. There was no need to tell them about their deep dependence on it. Living directly on the earth and feeling its rhythms daily, they innately knew that Earth’s sys-

tems had to stay in balance. If one system or resource was changed or depleted, other resources would be affected and the tribe’s survival would be threatened.

One powerful symbolic aspect of Native American languages is that each word vividly conveys some aspect of how people lived connected to the earth and its natural systems. The word for an everyday object, like a cooking bowl, could convey a whole lifestyle of honoring nature’s provision of food. In interviews, Lame Deer explained that virtually every word in his native tongue was a symbol for his culture’s way of being in the world. And that way of being honored the earth.

On his website “Story Fields,” Tom Atlee describes how, being immersed in nature, the entire cultures of indigenous tribes were shaped by Earth’s “story fields”—the web of stories told by the natural world. “The cycles of the seasons, the intricately interwoven lived stories of specific plants and animals around them, the great dances of the sky and the earth, the wind and the trees, the sun and the moon and the stars” all told their stories. As native tribes listened to the earth speaking about these things, their experiences led to words and ways of expression preserved in their languages. Native Americans of the Great Plains called their story of nature the Medicine Wheel, the wheel of life, and that story field molded their thoughts, perceptions, language, behavior, and entire culture.⁵

Often the important stories of diverse cultures will be found to be telling us the same truths. Oral history recounts a famous speech by a well-known Native American elder. After hearing and reading the story of Christianity—how it teaches us to treat one another with love and how we are to respect our community and be stewards of

God's creation—he declared without doubt that “Jesus was an Indian.” This tribal leader read the words of Jesus as affirming what Indian culture had long practiced in terms of caring for its elderly, building a strong social support network, and being in synchronism with the natural systems of the earth.⁶

Wherever our spirituality lies, we are called by the desperate needs of humanity to ponder our spirituality in terms of how well it supports us in our respect and care for God's creation. “My understanding and experience of Native spirituality,” says educator and coach Denise Taylor, who grew up on a reservation, “is that awareness and connection with the Sacred is the underpinning of the whole world view—of the earth language. It was through listening for and to the Sacred (to the energy flowing through the greater field of life) in every aspect of life that one was able to truly speak the earth language—when to hunt, where the buffalos were located, where to camp, when to move camp—all discerned from this listening and deep connection with Great Spirit. ‘Not with the head, but with the heart.’ If this is left out of any system, it will also fail.”⁷

Environmental prophet and conservation pioneer John Muir also urged us to look to our deepest values and how they affect the cultural system in which we live our lives. He saw nature as the expression or “language” of a larger mind that could lead us back to sanity. In his pilgrimage to the Sierra Nevada Mountains around 1900, Muir experienced a profound revelation that natural systems are literally the work of God's hands expressing their creator's mind—and also their creator's heart—in the laws of the universe.

Structure of Native American Languages

To us [symbols] are part of nature, part of ourselves, even little insects like ants and grasshoppers. We try to understand them not with the head but with the heart, and we need no more than a hint to give us the meaning.

—Lame Deer⁸

Although our detailed knowledge of first-peoples' languages may not be complete, research indicates that most Native American languages had a surprisingly limited number of words. Every word used was essential to express a key element of their way of being, which was vital to pass along to their children.

When a language consists primarily of words communicating the essentials of survival—how to connect to the earth and be sustained by its systems—it can be a significant base of wisdom for us. Our task is to state what their language teaches our own culture about how to live within our culture. When we restate the language of the earth in our design of built environment, and employ sharing of byproducts in the expression, this restatement works to enhance symbiosis with the earth itself (environmental symbiosis).

Our built forms can be powerful expressions of the earth language, symbolizing what we know and what we value, in the same way the spoken languages of Native American cultures captured what they knew and valued: their positive interrelation with the earth's natural systems and their expression of this understanding through their structures.

Teaching the Earth Language to Our Children

A symbiosis district like Ivywild is a vivid “show and tell” for our children. It is a school where we can teach our children the earth language. The forms of the built environment teach them. The sharing of byproducts and conserving of material resources teach them. The way we cooperate and collaborate in our lives together teaches them. Our community gardens teach them how to nurture the earth and grow on it. Our teaching of arts and crafts shows them how to build in unity with the earth. And we will tell them: We will often and carefully tell them what all these things mean. This experiential knowledge will become a part of who they are. They will become the kind of people who know how to work with the earth and with each other in order to survive.

Modeling Natural Systems through Biomimicry

A great step forward in learning to work with the earth came with the realization that one of the best ways to align with the earth is simply to mimic it. This is the underlying principle of the newly emerging field of biomimicry.

Biomimicry (from *bios*, meaning life, and *mimesis*, meaning to imitate) is a new discipline that studies nature’s best ideas and then imitates these designs and processes to solve human problems. Studying a leaf to invent a better solar cell is an example. We think of it as innovation inspired by nature.

Nature, imaginative by necessity, has already solved many of the problems we are still struggling to solve. Animals, plants, and microbes are the consummate engineers. They have already found what works, what is appropriate, and, most importantly, what lasts here on Earth. This is the real news of biomimicry: After 3.8 billion years

of research and development, nature offers us time-tested designs that have prevailed over numerous challenges, and offers evolutionary learning that could help us design our own survival.

Like the viceroy butterfly imitating the monarch, we humans should be imitating the best-adapted organisms in our habitat. When we do, we learn, for instance, how to harness energy like a leaf, grow food like a prairie, build ceramics like an abalone, self-medicate like a chimp, create color like a peacock, compute like a cell, and run a business like a hickory forest. The symbiosis style of architecture embodies biomimicry.

Symbiosis is a profound example of making progress by imitating nature. “Endosymbiosis” is already an established evolutionary concept—a way to move life forward. Evolutionist Lynn Margulis demonstrated that a major organizational event in the history of life probably involved the merging of two or more lineages through symbiosis. It has become clear that symbiotic events have had a profound impact on the organization and complexity of many forms of life.⁹

The conscious emulation of life’s genius is a survival strategy built into the functioning of a symbiosis district as it moves toward self-reliance. The more our built environment functions like the natural world, the more likely we are to endure on this home that is ours, but not ours alone.

Nature as Model, Measure, and Mentor

To consciously emulate nature’s genius in our neighborhood’s daily life, we need to view nature more insightfully. Innovator Janine Benyus and her pioneering colleagues at the Biomimicry Institute suggest that we can look at nature most productively as model, measure, and mentor.¹⁰

Nature as model: Biomimicry studies nature’s models and then emulates its forms, processes, systems, and strategies to solve human problems—sustainably. Benyrus’s worldwide team of consultants at the Biomimicry Guild have developed a practical design tool, called the Biomimicry Design Spiral, for using nature as model.¹¹

Nature as measure: The Biomimicry Guild employs an ecological standard to judge the sustainability of an innovation. After billions of years of evolution, nature has learned what works and what lasts. The use of nature as a measure is captured by the Guild in Life’s Principles and is embedded in the evaluative step of the Biomimicry Design Spiral.

Nature as mentor: Biomimicry focuses on respecting nature rather than subduing it. As Benyrus says on her organization’s website,

Biomimicry introduces an era based not on what we can extract from organisms and their ecosystems, but on what we can learn from them. This approach differs greatly from bioutilization, which entails harvesting a product or producer, e.g. cutting wood for floors, wildcrafting medicinal plants. It is also distinctly different than bio-assisted technologies, which involve domesticating an organism to accomplish a function, e.g., bacterial purification of water, or cows bred to produce milk. Instead of harvesting or domesticating, biomimics consult organisms; they are inspired by an idea, be it a physical

blueprint, a process step in a chemical reaction, or an ecosystem principle such as nutrient cycling. Borrowing an idea is like copying a picture—the original image can remain to inspire others.¹²

Symbiosis Makes Biomimicry Visible

Symbiosis applies the concept of biomimicry to the built environment, so that the earth language can serve as a cultural symbol. As designers, we translate our symbolic message into the built environment where it becomes literal. By embodying symbiosis in structures, we gradually develop a “vocabulary” that people come to recognize. Once this symbolism is recognizable, people can translate the symbiosis they see in the built environment to other areas of their lives. Also, they can recognize symbiosis when they see it embodied in other places or in the natural world.

One of the most beautiful and evocative visual languages of symbiosis in the built environment is light. The manner in which light is collected, redirected, and stored by buildings can emulate photosynthesis in plant species. In photosynthesis, light is processed to efficiently produce useful byproducts for the system. With plants the byproduct is oxygen. In the built environment the byproduct is human activity and inspiration. Building façades can be articulated with a variety of elements crafted to utilize light (or solar gain) and manage it both functionally and aesthetically.

A secondary vocabulary of symbiosis is the flow and exchange of byproducts mimicking nature’s 100% reuse of byproducts. In nature there is no waste: Byproducts

are recycled as resources or fuel. Principal byproducts at Ivywild are grey water, heat, and compostable materials. The process for reclaiming, exchanging, and transforming these resources should be made visible in our designs and reinforced visually in the architecture of the built environment at every opportunity.

Each Community as a System—Natural, Built, and Human

Although our viewpoint was generated independently, our design philosophy partially parallels some of the excellent work of the New Urbanists. But, as we have pointed out, there is a critical difference. Our work fills a gap in New Urbanism’s agenda, which ignores essential requirements for attaining the level of sustainability our planet requires. Symbiosis is intensely local and intimately earth-oriented. The symbiosis model is firmly grounded in the earth language. Our designs incorporate the climate and the sun. These principles of symbiosis generate the needed level of sustainability that New Urbanism principles alone can never hope to achieve.

In his book *Collapse: How Societies Choose to Fail or Succeed*, Jared Diamond¹³ agrees with Arnold Toynbee that “civilizations die from suicide, not by murder” when they fail to meet the challenges of their times. In analyzing cultural collapse, Diamond focuses on 12 environmental problems facing humankind today (these are listed in Chapter 5). The list includes four factors new to our times that may contribute to the collapse of present and future societies: (1) human-caused climate change, (2) buildup of toxins in the environment, (3) energy shortages, and (4) full human utilization of the earth’s photosynthetic capacity.

All of these four new factors tax the carrying capacity of the earth. By comprehending the earth language, we avoid overburdening natural systems to the point of collapse. As a fluent speaker of the earth language, symbiosis communicates with the earth and builds only what the natural systems can support.

Intimately Learning the Earth Language of a Specific Locale

To speak the very specific dialect of a local environment, we tap into what author David Orr calls “the genius of particular places.”¹⁴

The language of a microclimate is communicated in its native landscape. Observing native plant materials, we can quickly see what the local systems will sustain. Our task is to embrace the smaller set of principles that applies to this particular climate, rather than trying to impose a more generic or foreign way of building.

We study the specifics of a locale to gain a full understanding of its details while seeking to understand the more general nature of the overall system. Ultimately, these specific details, such as the number of sunny days in a typical winter season, or the amount of annual rainfall, interrelate to make up the “dialect” of the earth language “spoken” in that locale.

The dialect—the specific details of a particular locale—is what we mean by a *microclimate*. The microclimate, as the local dialect, must define the principal direction for our built environment, rather than a preconceived set of design principles, however elegant or palatable they may be. If we impose preconceived design philosophies without considering the local climate, we fail to serve the values of the community—and set ourselves up for failure and loss of symbiosis.

Climate-based design preserves the deepest sense of what it means for a community to participate in its own design process. The way people adapt their lifestyles to their specific climate is a critical part of their cultural expression. This expression, which evolves over time, is both functional and artistic. It represents a cultural agreement about what people want their community to look like and how they want it to work.

It's difficult for people to enjoy using a building that fails to respond to environmental forces and, in effect, puts them at odds with the local environment. If we have 200 days of rain annually, for example, the roof form must express how we need to shed, collect, or direct the rain.

Our holistic philosophy of design combines environmental symbiosis and aesthetics. We don't believe these two qualities have to be at war. We don't believe "green" buildings have to look ugly or out of place. Our mission is to produce buildings that fit their locale while being high functioning, and simultaneously inspiring.

Disrespect for the locale's earth systems can cause alienation from the earth. If they have to live and work in architecture that resists or ignores the earth, residents feel disconnected from local natural systems. Life no longer seems connected or natural, because it is indeed manufactured. A citizenry living in a built environment that was generically designed hundreds of miles away, based on the assumption it could be forced onto any and all climates, feels disconnected and awkward (at best). Such communities begin losing their local identity and lifestyle.

In contrast, when the local climate is expressed in the local built environment, it becomes part of an aesthetic that rings true, that feels authentic to a community. So,

our goal is always to respond to the locale with an artistic expression that elevates or challenges the human spirit of that specific community; this begins by addressing environmental symbiosis. This respect for local environmental parameters likewise respects the embodied learning of vernacular architecture that people have evolved for themselves over time—because it works.

Being grounded to the local earth, respecting local design knowledge, and elevating the local spirit are essential design goals if we are to realize the mission of locale-specific design that is written in the earth language.

Practicing an Architecture of Common Sense

When we speak the earth language in our designs, we naturally begin to use a commonsense approach. Common sense in architecture communicates with the broad-based core of our populace. People start liking the buildings in which they live.

Architecture, like most arts, goes through phases, which sometimes can fall to the level of fads. Designers jump on the prevailing bandwagon and put fundamental considerations aside. Modernism, postmodernism, and deconstructivism—all highly influential movements in architecture—contributed challenging concepts, and still influence design, but are often based on a dubious foundation that ignores long-term sustainability.

Deconstructivism, in its multiple and sometimes confusing expressions, presents itself as a basic rejection of the order and simplicity put forth by modernism. It also rejects postmodernism's ironic acceptance of the historical references and frivolous decoration that modernism shunned. The deconstructivist style sought to express and interpret, rather than mitigate, the chaos and fragmenta-

tion of contemporary life. Overall, it took a confrontational stance toward much of architecture and architectural history, wanting to disjoin and disassemble (i.e., “deconstruct”) architecture. This mimicked the prevailing current in literary criticism and analysis at the time.

Deconstructivists departed from historical forms and often produced designs that had nothing to do with climate or locale. Alignment with the earth’s system was far from their goals; in fact, it was irrelevant to their cultural objectives.

A moderating movement has arisen in response to deconstructivism, called *critical regionalism*. Critical regionalism reaches back behind deconstructivism and attempts to reconcile the universalism of modernist architecture with the differences to be found in specific geographic and cultural locales. In effect, this is an attempt to generate a modernist vernacular. Often, though, the projects seem to lack self-criticism and idealize local environments, such as romantic notions of the “English countryside,” rather than directly engage with the realities of those environments.

Today, in a world whose very survival depends on sustainability, we are compelled to disagree with these approaches and to insist that form must originate from a consideration of climate and locale. Without a functional and aesthetic relationship to local climate, architecture is merely fashion spinning emptily through space.

In a recent meeting at a high-ranking Air Force official’s office, the Chief Energy Officer made the statement that “form follows function.” We do not agree. Our team countered that *form follows climate* first, and that form has to be expressive of local natural systems. “Form follows function” may sound intuitively correct, like many erro-

neous “truisms,” but it comes from a period in architecture when technology reached such a level of control that architects became arrogant. By relying on technology, architects thought they could ignore natural systems—that nature was no longer important. “We have cheap energy and plenty of artificial types of fuel,” they thought. “We don’t have to rely on the land or the natural systems to support us, because we can rely on new technology to make it all work.”

Many consider Louis Sullivan to be the father of American modernism (Frank Lloyd Wright was Sullivan’s most prominent protégé). Sullivan first coined the phrase “form follows function.” He believed that expressing the intellect through the built form demonstrated humans’ power and control over materials and the environment.

People continue to repeat phrases that state conventional wisdom, like “form follows function,” because those sayings are clever, they roll off the tongue, and they are accepted as fact because they just seem right. But we propose that form follows the earth; that the wisdom of the earth language should define the form of our buildings. Form should “follow” the local climate. Form should embody biomimicry. Through Ivywild, we aim to develop climate-based forms that memorably express environmental symbiosis!

The real danger in glib phrases is that they mask an arrogance that blithely ignores what the earth is telling us. Reading what Charles, Prince of Wales, and others concerned about the earth have written in recent years about architecture, we find that they also recognize an arrogance among designers that disregards natural systems. In fact, we believe modernism arose from design arrogance. For architecture to be the product of intellectual theory alone

is highly irresponsible. Architecture is certainly an art form, and intellectual theory has a valid role in every art. But architecture is fundamentally about service to humanity. To have lasting value, it must first seriously engage with climate and locale.

In support of the role of theory in architecture, we should note the considerable body of extremely impressive and socially responsible intellectual debate that has helped shape the finest contemporary theories of sustainable design. That theoretical debate, seeking to define interrelationships between social responsibility and aesthetics, has our full support.

Of course, common sense can have strange bedfellows. Historically, designers deemed radical or unrealistic at the time have often been catalysts in getting important ideas on the table. Influential architect Christopher Alexander risked alienating fellow designers and architects by asserting that people should design their own houses. Now, what would that do to architectural fees?! But we agree that architecture is ultimately about social empowerment rather than promotion of an elite professional class.

Generally, architecture as a professional field seems more focused on commercial projects than on dwellings for typical citizens. Architectural publications most often showcase large-scale retail development, impressive office buildings, mind-bending civic structures, huge arenas, and so on. Such projects, however, represent only a small percentage of the built environment globally.

Certainly the earth language can be spoken through larger projects. However, many publicized large-scale buildings end up being temporary because they are merely fashionable. Fashion can change so rapidly that many of these buildings fall out of favor even before their construc-

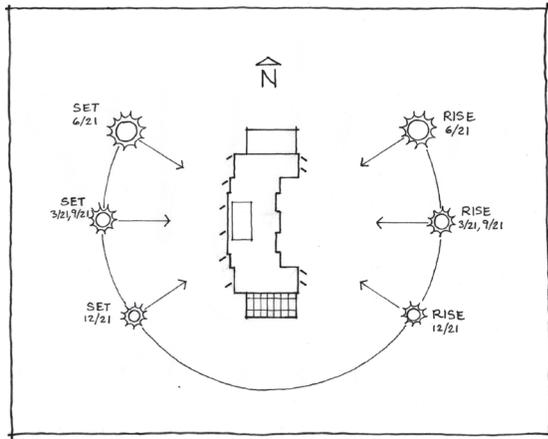
tion is complete. They don't take root in the local culture. Often they are remodeled to the point of being no longer recognizable. People just don't like them.

Dwellings—our homes—are the principal representation of architecture throughout the world. Homes merit the attention of designers and architects willing to spend time and effort understanding how to create housing that speaks the language of the locale while serving the functional and aesthetic needs of the occupants.

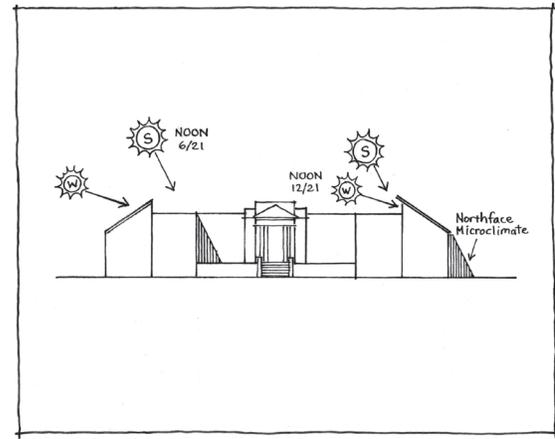
What would it mean for people to design their own houses? Most people would say “I am not capable of designing my own house.” Lots of Americans would probably say that. But in the rest of the world, many people do in fact design and build their own dwellings. Utilizing the accumulated wisdom of their community, they just keep figuring out what they need and build it. They figure out smart ways to work with the climate and locale. Through the types of spaces they create, they reinforce the activities and values that are important to them.

This is what Alexander was saying. If a “dwelling” is synonymous with “living,” then a home is all about the way people live. When Alexander said people need to design their own houses, he was saying their dwellings should serve the way they live. Whether we ourselves do the building, or hire architects and contractors to do it, our dwellings should make sense to us.

The symbiosis style of architecture supports Alexander. By practicing symbiosis, people can learn to build homes and other buildings that reconnect them to the earth's systems. We can express ourselves in architecture that expresses our personal values while fulfilling our commitment to the earth. We can each build a home that inspires our whole neighborhood to reach out for a better future.



Sunrise and sunset angle around a building at different seasons.



Eye-level view of a building: seasonal sun angles at noon.

Why design buildings that depict fragmentation and create symbols of a fallen society? Where does this leave the human soul? Can architecture abandon people in their daily battle to create a life that is generative, nourishing, and life-giving? Can architecture abandon the earth and its systems that support human life? We ignore to our peril what the earth language is frantically telling us. For the sake of the common good, our arrogant belief that we can control nature and rely on environmentally-harmful technologies must be changed.

Designers are called to create architecture that spurs people forward—that creates new hope and motivation toward a lasting society. For this reason, we propose a counterargument to the various “isms” of modernism, postmodernism, deconstructivism, and even, in some respects, New Urbanism. We stand in favor of the symbiosis style of architecture: a commonsense expression that speaks the earth language.

Highlights

1. Building an Ivywild district begins with cultural symbiosis and the district grows organically through it: a continuous cultural symbiosis.
2. Environmental symbiosis is the initial area of focus:
 - a. The district's principal intent is to maintain balance between the natural and built environments.
 - b. It seeks to build with minimal impact on natural systems.
 - c. It maximizes available natural, renewable resources.
 - d. Its goal is to eliminate the need for energy from off-site sources.