CONSCIOUSNESS IN PLACE

A Note on Context: I prepared this essay as a talk script for an invited keynote at a 2023 seminar at Wesleyan University organized by artist and professor Tula Telfair entitled "Artificial Intelligence or Artificial Consciousness?" The panelists for the two-day event included medical ethicist Dr. Joseph J. Fins, planetary geologist Martha Gilmore, philosopher and cognitive scientist Steven Horst, inventor Charles R. Sperry, artist Amber Frid-Jiminez, architect Nathan Rich, civil rights attorney Rashida Richardson, human rights lawyer and professor James Cavallaro, media researcher Hong Qu, computer scientist and professor Christopher Weaver, Colorado U.S. Senator Michael Bennet, and NBC Correspondent Jacob Ward. The conversations were aimed at questions about AI in the context of invention, authorship, bias, human rights, creativity, policy, and oversight.

As the opening keynote, I felt it best not to "take sides" in the argument suggested by the seminar title, but rather to come in "sideways" with some observations about how the sense of place is a keystone of consciousness, inviting the audience to consider whether AI now or in the future will be capable of achieving a anything like a sense of place, or if some other kinds of "knowledge" can take the place of place, as it were, in the development of artificial consciousness.

The recording of the talk had some technical problems so I have re-cast it here as a written essay. I hope that you will enjoy it.

Whether in wild-built or human-made environments, the experience of embodied presence in a fuel feedback that fuels the spiral dance of growth. The sense of Place foregrounds the fundamental, interwoven ingredients of Consciousness – sensation and perception, emotion, memory, meaning-making, identity, dreaming, and spirituality.

A space becomes a Place as one attends to it. It may be a field one farms, a house one lives in, a tree one climbs, or an artwork that one enters. I want to consider how we make and un-make Places, how we know them, remember them, mark them, represent them, and enfold them into our personal identities.

For grounding, I turn to the wisdom of Barry Lopez, an explorer, scholar, writer, and singularly acute observer of nature and culture. He was a mentor and friend to me. These words that he wrote in 1988 have inspired me throughout my adult life, and I find them relevant to our conversation here:

> Among the Navajo and, as far as I know, many other native peoples, the land is thought to exhibit a sacred order. That order is the basis of ritual. Art, architecture, vocabulary, and costume, as well as ritual, are derived from the perceived natural order of the universe - from observations and meditations on the exterior landscape.
>
> An indigenous philosophy […] may also be derived from a people's continuous attentiveness to both the obvious […] and ineffable […] orders of the local landscape.

> **Each individual, further, undertakes to order his interior landscape according to the exterior landscape.** To succeed in this means to achieve a balanced state of mental health.

I think that interplay between exterior and interior landscapes, as Lopez describes, is a built-in affordance of what we call "human consciousness." I think that each of us has an intrinsic need for such relationships – a plug for that Gaian socket, as it were.

Bosque, Rio Chama

If we do have this propensity, how might it function with exterior landscapes in cultural or social positions that do not prioritize relationship with "the land"? What if one is *not* a member of an intact indigenous group, *not* a rancher or a farmer or a park ranger, but a kid living in an anonymous suburb or housing project?

My thoughts go to suburban developments in the US that were designed to house veterans returning from WWII. The GI Bill, signed into law by FDR in 1944, guaranteed veterans' funds for college education, unemployment insurance, and home mortgages. Real estate developers Abraham Levitt and his son William saw a grand business opportunity.

The Levitts designed a method of building homes that was like an assembly line where a home could be built in one day with a crew of 36 men. The fly in the ointment was Levitt's refusal to sell these homes to non-white veterans despite government guarantees.[1]The controversy about racism in Levittown foreshadowed the ongoing systemic racism in the US today, but that's another conversation. Several "Levittowns" were built in various US locations. And thus, the "Burbs" were born.

Those "suburbs" were advertised as pleasant, modern, vibrant, family-friendly neighborhoods, but when you look at images of a Levittown from the air, what you see is a parade of identical little houses. These images give me the chills. The overwhelming *anonymity* of them and later developments like them led to popular ridicule as exemplified in Pete Seeger's song, "Little Boxes." And yet.

Herein lies a personal tale…

Brookhaven

My earliest memories of living in a place were in a suburb of Indianapolis, Indiana called "Brookhaven." By the way, this is the first evidence I discovered for my theory that neighborhoods and streets are often named after what they displace, like "Fox Run," or – my favorite – "Solitude," which ran adjacent to a busy highway in Indiana.

Like Levittown, Brookhaven was tailored to veterans and the GI Bill. It had a grid of streets lined with fairly identical houses on less than ¼-acre lots. These homes were what one might call "non-places" until they were imbued with meaning by those who lived in them.

My family bought a house in Brookhaven in 1955. That house started becoming a place for me when my grandmother made me a bedspread and my father painted my bedroom lavender. Although I remember little about the adults in the neighborhood, I came to know my immediate neighbors' kids. The six Irish sisters who lived kitty-corner regularly kicked my ass at kickball. I sometimes joined two little boys across the street to bake horrifying pies in their Easy-Bake oven. And I could be sure to whup the little girl on the corner at jacks. The commotion of families, kids playing outside until dark, the cold, blue sound of roller skates on pavement, the smells of dinnertime – these kinds of things made a Place out of a neighborhood of little boxes. I'd guess that might have been the case in Levittown as well.

Most of the time, I sat in my lavender room reading books, with occasional brisk rides around the block on my red Schwinn to bring myself back to my senses. As an only child, solitude suited me.

I was, however, fascinated by the local garter snakes, and I am fond of snakes to this day. I made little cardboard apartments for them outside the house where they dwelt as pampered captives, at least briefly, before Mother repeatedly sent them off and put the boxes in the trash. She also sent away the baby chicks I kept in the kitchen when one of them got old enough to sit up on the edge of his box and crow in the morning.

A lot of make-believe blended seamlessly into my sense of that place. Our house had a "utility room" at the back of the carport in which I found some theatrical opportunities.

I remember decorating the little room with aluminum foil and fabric to make it into a mine for the seven dwarves from Snow White. I recruited some local boys to come and hide in there for a while making mining noises, then come out and play Snow White with me. We played cowboys and Indians with the utility room as our fort. (I was always cast as the Indian, so I always died early in the game.) Once, on a very snowy evening, my father offered me a sleigh ride. He opened the carriage house door – the utility room – to reveal my awesome sleigh and magnificent pony. He had leashed our mighty dachshund to my sled, and that muscular little dude bravely pulled me around through the icy neighborhood. I was the Queen of Winter.

The super-special secret of Brookhaven was the second-growth woods to the north – the "haven" of the "brook" that was almost gone. In springtime, my mother and I went to the woods to gather violets and Sweet William and Dutchman's Breeches to arrange and hang on neighbors' door-knobs on May Day, although I am fairly certain that Mother had no clear idea of the folk and pagan sources of the custom.

Mother always warned me, "Don't go to the woods alone. There are boys in there." Of course, I went to the woods alone as often as I could. I was drawn to the wildness of it, the chaotic order of a natural place so different from the rectilinear order of a house. Yes, boys were there somewhere – I'd glimpsed them watching tadpoles and water-striders in a little pond – but the woods were My Place.

Thomas Meacham, an Australian "human geographer," calls a child's first home a "primal landscape."[2] It sets the tone for future relationships with environments. Children discover places largely through play. As a child in a home-based culture develops a sense of place, they are also learning about social relations and community. I can see how all those bits were set for me in Brookhaven.

I went back to Brookhaven about 25 years ago. A few thin, somber-faced kids looked up as I drove by. Economics, culture, and so-called "development" had changed everything. The woods were gone. Today, the house I lived in still stands, barely. Although *it's* not a place to me anymore; the *memory* of it is. The power of play and make-believe made it a place worth remembering. And I've always found a distinct and profound sense of belonging, of Place, in the woods wherever I have lived since then.

Before I leave Indiana, I want to offer a story about my Dad. He was an urban planner, and eventually, director of area-wide planning for Marion County. In the late 1960s, housing projects were being built in Indianapolis, intended to serve migrants to the city, mostly from Appalachia and parts farther south. My dad worked near the top the City-County building – the tallest in the city until 1970 with a whopping 28 floors. His office had a grand view laid out before it.

When I went to visit him there one day I was struck by a photo on his wall. It was a view of the Indiana Statehouse dome through the half-moon of an outhouse. He explained that new residents to the projects built outhouses on the perimeter, because – at least for the migrants – that familiar aspect of their previous lives gave them comfort. The copper pipes from the indoor plumbing could be stripped and sold for income. He had the photo in his office because the outhouses profoundly changed his idea of what housing for folks "not from here" ought to be like. Later on, as the Model Cities project rose and fell, he would just shake his head.

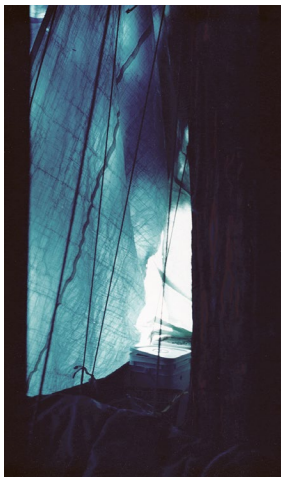
My Dad taught me the value of understanding people, *actual* people – how they construct their personal identities and sense of place. "Urban redevelopment" initiatives throughout the US in those years produced soulless housing projects that profoundly impacted the lives of those who ended up living in them. Of course, community can and does exist in a housing project or a refugee camp, and people can personalize their spaces to an extent, but their personal agency has already been attenuated, and often their sense of safety as well. Living in a state of displacement, fear, and powerlessness surely affects the consciousness of an individual and the life of a community.

My great good fortune is the way that trees and forests always feel like home and how they shape my consciousness – what I value and how I perceive, understand, and dream.

About Trees

Taking care of trees, especially trees under threat, is called "Tree Guardianship." Sometimes this involves civil disobedience. When my eldest daughter Hilary was 14, Julia Butterfly was up in trees. Between December 1997 and December 1999, Julia lived in a 200-foot-tall, 1000-year-old California Redwood to prevent the Pacific Lumber Company from cutting it down as part of a clear-cutting project. The initial cutting had resulted in a massive landslide that buried most of the community of Stafford, California in 17 feet of mud.

A similar fate awaited a stand of old-growth Douglas Firs in Northern California where clear-cutting would likely devastate the habitats Coho Salmon and several endangered species. Hilary was inspired by Julia Butterfly. So she volunteered to sit – to live, really – in one of the tallest firs for three weeks. Food and water were hoisted up to her on ropes. She sang, read, and took pictures. She also got giardia, but didn't come down until the next tree-sitter arrived to relieve her. After that, she was invited to talk about the trees and her experience to science classes throughout her local school district. In 1998 the governor of California suspended the license of the Pacific Lumber Company for several flagrant violations of code. Hilary, like Julia, made a difference.



The number of trees is rapidly diminishing in North American urban landscapes as well as in forests. Dutch Elm disease took out the gorgeous giants used to arch over the streets of towns in the US – New Haven's elms were gone by 1950. The North American Ash and the American Chestnut are also in precipitous decline. According to the nonprofit American Forests, the US is currently losing one for every two established trees in urban areas every year. Commercial and residential development, disease, and extreme weather events are culprits. The loss – or absence – of trees is most dramatic in disadvantaged areas.

Potential compensations are afoot. Here's an example: Akira Miyawaki, who passed in 2021 at age 93, was a Japanese botanist and ecologist. He observed that the trees growing around temples and shrines were relics of indigenous forests that had been protected from disturbance. He developed and refined a method of ecological engineering to restore native forests from the seeds of native trees on degraded soils. Miyawaki "mini-forests" are small urban plots of land that can be densely planted with many local species of trees, to reintroduce varied wooded habitats that are rich in biodiversity. They can reach self-sustaining levels within 7 years and mature in 20, where a "natural" forest takes about 200. The Miyawaki method has been used to create more than 1,700 mini-forest projects around the world so far.

Trees play a vital role in human well-being and in the character of the Places where we live. Trees shade buildings in summer and block winds in winter. They provide a closeness to the natural world for folks in urban environments, and create spaces for exploration and play in kids' "primal landscapes." Preserving and re-planting trees is part of what I call "Gaian Gardening" – simply put, the term describes *active care* for the whole of the Natural World and all its entities in order to nurture the dynamic balance necessary for harmonious, flourishing life on Earth.

For a dose of spiritual energy, I like to put myself in physical contact with trees. Yes, I'm a tree-hugger.

My chest touches the tree's bark, and after a time, it seems, our skins dissolve as what is inside reaches toward itself in the other. Time is strange in these encounters. The body of the tree may have taken centuries to grow, but the hug is timeless. Joined by energy or spirit, I feel a great lightness within it, even though it weighs more than I can imagine. There is a coolness to it that soothes and nourishes me.

I found my own home in the forest of the Santa Cruz Mountains in Northern California where I lived with the trees for 38 years. I raised my children there. It was a glorious Place for all of us, surrounded by more, nested Places in the woods like the bridge that crossed the creek in the canyon, where ladybugs came to breed year after year.

Long after the children had grown and gone, fire finally came too close to home. My partner and I moved to the desert, to Santa Fe. No, I have not hugged a Cholla or a Piñon, but I have found Hazel and Oak, Cottonwood and Aspen – many trees to hug with love in my new landscape.

The Erasures of Place

The *erasure* of Place is as profound as the making of it. The loss or destruction of a place may also be the loss of a way of life, sustenance and health.

The woods in Brookhaven succumbed to an overgrowth of what urban theorist Mike Davis calls "non-places". He offers shopping malls, gas stations, convenience stores and fast food chains as examples. You will find a McDonald's or Starbucks in just about any city or town in the United States, and most other places in the world as well, replacing not only local neighborhoods and businesses, but also the communities that they nurtured.

There's a word for how that feels, as you probably know. *Solastalgia*. It's a certain kind of grief, born of the distress caused by environmental change - a sense of profound loss over things that will not come again.

As I grieve the loss of a tiny strip of third- or fourth-growth forest in Brookhaven, I know that the Places of thousands of generations of people have been overwritten or erased there over time. People lived in Indiana as long as 8,000 years ago.

The Adena culture built mounds for conducting ceremonies and viewing astronomical events. The Great Mound near Anderson, Indiana, was built in about 160 BCE and is older than the Roman Coliseum. I played there as a kid. The Mississippian culture, also fond of mound-building, built a series of urban settlements linked together by trading networks. The great city of Cahokia was built by them in what is now called Illinois 1,000 years before European contact.

The Mississippians disappeared about 200 years before Europeans first entered what would later be Indiana. Between then and now, Indiana was home to Iroquois, Algonquin, Miami, Pottawatomi, Lenape, and Shawnee people.

So while this little white kid bemoans the fate of her suburban neighborhood, she recognizes the millennia when other cultures and other folks called that place Home. The Places they made were inseparable from their culture, community, and consciousness.

An Indigenous American Senses of Place

Many of us have heard the saying that Indigenous people do not own land, but rather are in reciprocal relationship with it. Of course, there were intertribal territorial wars in North America with "reasons" ranging from revenge to raiding. Yet, most indigenous people in what is now the US and Canada subscribed to a particular view of their relationship with the land; saying not that they own it, but rather that they are part of it.

Shiprock, pictured here, plays an enormous role in the myths and origin stories of the Diné people. It rises in Northern New Mexico and is seen as a marker of the spiritual heart of the Navajo nation.

Diné environmental activist Talia Boyd says:

> The idea of "owning" land is a foreign concept for Native peoples. The land is sentient. It encompasses many life forms and spaces. It holds immense energy. From a Native perspective one cannot "own" land, yet one may live with the land. Our regenerative relationships to land are based on generations of deep interconnectedness that have been taught through our cosmologies, ceremonies, and languages. Native peoples acknowledge that these on-going connections require responsibilities to the natural world. We provide offerings and prayers to the land for its healing. Traditional teachings instruct us to maintain deep respect for land, life, and our four-legged and winged relatives — all our relations.[3]

There is an ongoing debate in the field of anthropology about ecological knowledge among indigenous people worldwide. The 'traditionalist" view typically frames land knowledge as a set of unchanging rules passed down through generations. A more accurate – and generative – view says that indigenous land practices are based on "*local* ecological knowledge." The key difference between the two framings is that, in the *traditional* view, "knowledge" is treated as an *object*, whereas in the *local* view it is seen as a *process* governed by embodied interaction and experiential learning within spiritual frameworks. Dynamic engagement - as opposed to performative, rule-based behavior – rightly characterizes indigenous practice as *conscious participation with the land*.[4]

I find inspiration in a contemporary example called Spirit Farm. It was founded by James and Joyce Skeet in 2001 on the Navajo Nation. They characterize it as an "experimental farm that recovers and reclaims traditional farming and spiritual practices through Indigenous regenerative agriculture." The Skeets also founded the nonprofit Covenant Pathways to support educational outreach.

Joyce and James Skeet, founders of Spirit Farm
image from the Robert Wood Johnson Foundation report on Childhood Obesity[5]

Reservations are very often "food deserts." Spirit Farm is a response to the physical and emotional health problems like childhood obesity caused by "commodity foods" (like gas-station junk food). The Skeets saw that the land's resilience had been undermined by exploitation, overgrazing, and climate change, so their regenerative mission began with the health of the soil. "They composted and built bioreactors. They grazed Navajo-Churro sheep and used cover crops to improve the soil microbiome." Through their collaboration with preeminent soil biologist Elaine Ingram, they also

blended modern methods of measuring and amending the components of a healthy microbiome with their own "land intelligence".

James Skeet says:

> Tribes in the southwest have always depended on land intelligence as a sophisticated and complex system of engagement with the environment [….] It is rich, complex, and colorful to the naked eye but to an indigenous person it is full of meaning, purpose, and identity. Celebrating nature and life with patterns of seasons and repeating the power of the circle creates a deeper understanding and sensitivity with the land.[6]

Many places in the Americas are the sites of revival and reapplication of indigenous earth wisdom. From Spirit Farm to the kelp gardeners of the Eyak Native Conservancy in Cordova, Alaska, we see indigenous knowledge re-invigorating indigenous communities. We can also see *outreach* from such communities to others – both indigenous and non-native – with ideas about how to revitalize our relations with land, sea, and the natural world.

The suppression of indigenous ways by colonial enterprises – including so-called "modern" agriculture, extractive industries, and peak-capitalist greed – have not yet silenced the echoes of what we know we knew and can know still, even as we are implicated in its erasure. The abilities to remember, re-vision, and re-engage are crucial aspects of consciousness.

Australian Aboriginal Construction of Place

Lungkura Rockhole, Australia. Image adapted from *After 200 Years*, Aboriginal photographer unknown.[7]

I am struck by how diverse the influence of place on consciousness is among different indigenous cultures, from the cosmic to the day-to-day. Having spent a portion of my work life in Australia, I learned some things about Australian Aboriginal peoples—their remarkable connection to the land and their completely unique sense of place. Taken together, Aboriginal peoples have inhabited the Australian continent and its proximal islands for at least 60,000 years, constituting the *oldest surviving culture in the world.*

I want to note that, as in the Americas, indigenous people in Australia continue to have their land claimed and exploited and their way of living and surviving disrupted and disrespected.

The BBC recently reported:

> Aboriginal . . . have inhabited Australia for about 60,000 years but are not mentioned in the constitution. They are, by most socio-economic measures, the most disadvantaged people in the country.[8]

The British began to settle in Australia a mere 235 years as of 2023. 61 years ago, Aboriginal Australians were "generously" granted the right to vote, and 15 years ago the Prime Minister finally apologized for harm caused by decades of policies including the forced removal of children from Indigenous families. This should sound familiar to people who are aware of the treatment of many indigenous peoples in the Americas.

Australia Map

Indigenous Languages Map[9]

Seven Sisters Songline Map[10]

The intricate relationship between people and their ancestral lands are a shared cornerstone of Aboriginal identity. In Aboriginal origin myths, the land and its features were created by Ancestral Beings during the Dreamtime. Anthropologist and linguist Peter Sutton describes it this way:

> Dreamings are Ancestral Beings. In that sense, they both come before, and continue to inhere in, the living generations. Their spirits are passed on to their descendants. Shark Dreaming, or Honey Ant, Yam, Wallaby, and the hundreds of other Dreamings known across Australia are part of the spiritual identities of those who claim them as their Ancestral Beings or totems. Groups of people who share the same Dreamings may constitute totemic corporations or clans.[11]

Over 60 millennia, Aboriginal Australians created what are called "Songlines" as part of both spiritual practice and physical navigation. Embedded within traditional song cycles, dance rituals, stories, and artistic expressions, these pathways enable individuals to traverse thousands of miles.[12] Songlines connect sacred Dreaming sites and also mark features like waterholes as well as "hand-over points" where linguistic boundaries are crossed, amounting in some tracks to *hundreds* of "places," marked in the song.[13] The song's words have been memorized in the languages of the lands that will be crossed. And language is not a great barrier because the melodic contour and rhythm of the song reflect the nature of the land over which the song passes, a kind of *musical synesthesia*.

The songlines reinforce "connectedness to country" and may also be thought of as bringing the country to life – singing it into being. In his book, *The Songlines*, anthropologist and writer Bruce Chatwin reported about a man he had befriended named Arkady, an Australian of Russian descent, who was mapping sacred sites. In one conversation with Chatwin, Arkady recounts an interaction with his Aboriginal "mob" (a common, non-offensive word for a group or clan) as they travelled together:

> "Sometimes," said Arkady, "I'll be driving my 'old men' through the desert, and we'll come to a ridge of sandhills, and suddenly they'll all start singing. 'What are you mob singing?' I'll ask, and they'll say, 'Singing up the country, boss. Makes the country come up quicker.'[14]

Aboriginal Australians have created hundreds of thousands of works of art about Dreamtime beings and Songlines – from rock art to bark painting, sculpture, and, more recently, in oil or acrylic on canvas as well. Such representations meld landscape with culture, tradition, and emotion in a kind of visual synesthesia. The 1984 painting by Aboriginal artist Michael Nelson Tjakamarra, called "Five Stories," uses color, pattern, and contour, to depict the Possum Dreaming, Serpent Dreaming, and a Rain Dreaming.

"Five Stories" by Michael Nelson Tjakmarra, 1984.

Dreamtime stories and figures appear in the amazing array of rock art throughout Australia. Over 100,000 works are known so far, and ranging in age from 30,000 to 1000 years. Like rock art from other cultures around the world, Aboriginal Australian petroglyphs and pictograms often riff on existing features of the surface of the rock, a technique called incorporation.

The Rainbow Serpent painted under a rock overhang in Arnhem Land is the largest pictogram discovered in Northern Australia to date. It bolts out at you, hugging the rock contours. About 8,000 years ago, somebody saw the Serpent in that rock, then painted it. "Pareidolia" is a brain phenomenon in which a person sees or hears something significant in a random image or pattern. It predisposes us to see animals in clouds and faces in rocks. Examples abound in the world's rock art, where the features of the rock likely called forth ideas about imagery. [And a caution – this is a good reason not to go petroglyph hunting when you are high.]

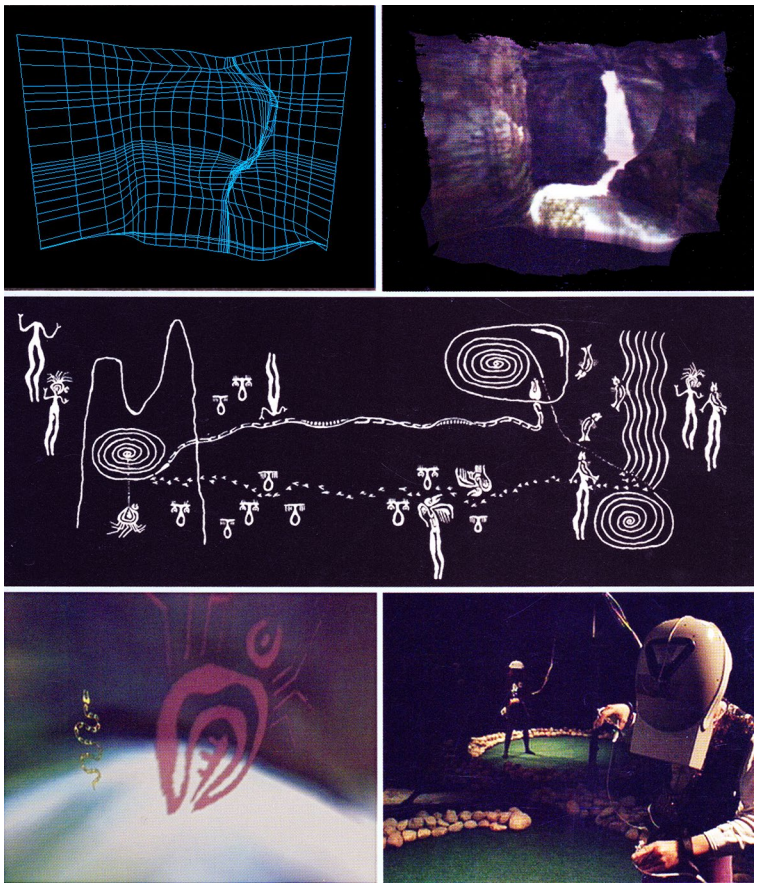
Exploring Place and Presence with Virtual Reality

In 1989 researcher and videographer Rachel Strickland and I began to hatch an idea. We had recently been shooting a short documentary in Zion National Park, where we visited some of the local petroglyphs.

Maybe that's how it started. We were both avid readers of Barry Lopez, and we were both deeply interested in ideas about place. Rachel asked the question, "What possesses people to leave marks in a place?" Virtual reality was a new thing in those days. We came up with a notion to create a virtual environment based on an actual landscape and to enable people to "leave marks" in it – to see how people might imbue a virtual place with personal meaning.

I want to say up front that we had no desire to *substitute* VR for the actual world. In those days there was a "cinema dome" at the entrance to Zion National Park. We had all seen how people would stop, watch the movie, then drive on thinking they had "seen" the park. Our goal was to create work that would be *indexical* to an actual space or place – that is, to *point* to it, to *celebrate* it. Through the project, we could explore different ways of thinking about and representing places. If people could take action within virtual environments, could they experience of a sense of *presence* in them? Might they then reflect differently on the Places in their lives?

We submitted a proposal to the Banff Centre for the Arts that was accepted late in 1991. I joined Interval Research Corporation shortly after it was founded in 1992, as did our future project engineer and my future life partner, Rob Tow. Rachel joined in 1993. She and I persuaded Interval to help fund the project in Banff, which we had ironically named "Placeholder." The Interval community – some of the brightest and best in tech in those days – was there to help us develop, implement, and evaluate the work.



Scenes from *Placeholder*: wireframe for virtual relief projection, video frame of waterfall, map of the worlds, smart costumes in-world, physical installation

Although our time frame to build the project was incredibly short, we were able to probe many of our questions and to make a pretty muscular design statement. In those days, VR was primarily used for training; we wanted to see if it could be used for exploration and play. We focused on three milestone goals – features we had not seen in other VR work.

One was to create multiple, connected interactive environments. We chose three sites in the mountains near Banff and "captured" them in a variety of ways according to their characteristics. The Cave environment would be mapped and represented primarily with sound. The Hoodoo environment would be constructed with tiled video. The Waterfall would be created using video and virtual relief projection.

We created portals, represented by spirals, that would move an interactor from one environment to another. We learned, by the way, that jump-cuts don't work in VR. People needed time – about 10

seconds – to transition from one environment to another, and we eased the journey by fading out sound from the current world and fading in sound from the next one.

Another goal was to support two interactors in the virtual world simultaneously. First, we had to think about how the interactors would appear to one another *inside* the world – for that, they needed virtual bodies – something we ended up calling "smart costumes."

A troupe of actors from the Precipice Theatre Company, an eco-activist performance group in Banff, helped us imagine characters through improvisation in the environments as well as in the studio. We devised a unique kind of embodiment, where each interactor could take on the form of a virtual critter. We chose four: Snake, Spider, Fish, and Crow.

The physical environment of the installation incorporated rocks and other elements from the actual landscape, setting up transitional "magic circles." Interactors were fitted with head-mounted displays and simplified hand controllers called "grippees".[15] Once "inside" the virtual environment, they found themselves in the Cave, for obvious Platonic reasons. At first, they could speak to and hear one another, but their perception of their bodies was limited to points of light corresponding to the positions and movements of the grippees on their hands. They encountered the "smart costumes" as talking petroglyphs arrayed around the cave walls.

The closer you got to them, the harder they would try to entice you to come nearer, and if your head intersected one, you found yourself embodied as that critter. In your critter body, you also took on some of its sensory-motor qualities – so, for example, Snake could see into the infrared, Crow could fly by flapping its wings. The other interactor could see you as an animated petroglyph, and your voice was changed to give the critter a characteristic tone.

Our third goal was to enable interactors to leave marks in the world. To this end we devised "Voiceholders" – gravity-resistant rocks that you could pick up and leave hanging in the air. They were there to allow you to leave and listen to audio messages or stories. The facial expression of a Voiceholder indicated its state – **empty, **listening, **having a story inside, or **speaking. One sort of emergent behavior we observed was the tendency for people to build on one another's stories in the Voiceholders, sometimes arranging them in spatial lattices.

Body-swapping was another emergent behavior we observed. For example, in one session when Crow and Spider were together at the Waterfall, Spider was frustrated that she couldn't fly like Crow up to the top and glide down, so she asked him to "share" his body. Crow kindly put his head into a

nearby floating fish petroglyph, becoming Fish and freeing up Crow body which Spider delightedly swapped into. Go figure.

Placeholder was a grand adventure that taught us much about how the character of Place takes shape in interactive virtual environments. In those days, using now-primitive technologies, we glimpsed the possible futures of virtual worlds and some of the challenges that lay ahead.

The Principle of Action

An important finding from the *Placeholder* work was confirmation of what Rob Tow calls "the Principle of Action" – riffing on William James' work in the 1890s - that one must be able to take *action* in a Place, virtual or actual, in order to feel a sense of presence. In Placeholder, the actions of moving around created both visual and auditory feedback with spatialized sound, and the actions of manipulating and leaving lasting marks within objects changed the world.

Action in the world is crucial in the development of consciousness. In a famous experiment conducted by Richard Held and Alan Hein in 1963, two very young kittens were attached by little baskets to a freely moving "roundabout". One kitten's paws were allowed to extend so that it could walk around and the other kitten was passively held, being carried about by the active kitten's movements. The goal was to test whether being moved around and seeing the environment change was sufficient to develop visually guided behavior, or whether the individual needed to experience self-generated movement in order to learn. After many hours of this activity, "passive" kittens failed to develop the ability – the brain regions – to navigate visually. They lacked part of a set of low-level qualia from action of their bodies and their senses that combine to create understanding of a scene or a space.

The experiment speaks of the need for a growing organism to experience its ability to take physical action in the world during a crucial, early developmental window in order for critical aspects of consciousness to emerge.[16] Indeed, human babies develop their consciousness as they act in a world which in turn presents itself in greater multisensory resolution, producing a plethora of feedback that fuels ongoing, burgeoning growth. *The ability to take action is essential to the experience of presence.*

Place Lives in the Nest of Consciousness

The sense of Place has vast underpinnings in human consciousness. Sensation, perception, and the experience of physical presence are interwoven with memory, imagination, dreams, spiritual beliefs, scientific and geographic knowledge, stories, music, myths. Consciousness creates a nest of incredible complexity and uniqueness for the hatching of a sense of home, a sense of here, a sense of this cave or that field or that tree as a Place.

In fall of 2023 I found myself in Gallina Canyon in northwestern New Mexico. The Gallina people had gone from there by 1300 CE. Now it is home to a small family of human caretakers, sheep, horses, snakes, bees, elk, and a few bears. My companion and I were camped in a place where there were no other people – no human footprints, no trash, no people-noise other than the sounds we made ourselves. On our last morning there, we decided to go out and greet the sunrise inside the canyon.

We drank strong coffee as the eastern horizon began to show milky blue. In the silence I could hear my heartbeat. We walked on dark sand into a meadow where shoulder-high sage-bushes grew all the way to the foot of the canyon's western wall. I stood still, save for brushing my hands occasionally through the sage and lifting my fingers to my nose. Reflected light began scrolling down the dawn palette of the wall – first mushroom, then dark yellow, then a stripe of white. Shadows began to reveal the contours of the rock. Faster then, the wall's face awakened to orange. High above the canyon floor, cedars impossibly growing on a thin shelf of rock painted shadows that stretched and quavered.

As reflected light kept rolling, awakening the colors of sage and flowers, a glow grew in the sky behind the black silhouette of the eastern wall. Tentative chirping began. Then suddenly, just like that, the sun came up. Morning strode in and took her place. I stood there for a long time.

[1] https://www.history.com/news/gi-bill-black-wwii-veterans-benefits
This website describes how Black WWII veterans were effectively denied housing and other GI Bill benefits.
[2] Measham, T.G. (2007) Primal Landscapes: insights for education from empirical research on ways of learning about environments, *International Research in Geographical and Environmental Education* 16(4) pp 339-350 http://dx.doi.org/10.2167/irgee221.0
[3] Boyd, Talia. "Native Perspectives: Land Ownership." June 29, 2021. https://www.grandcanyontrust.org/blog/native-perspectives-land-ownership
[4] See, for example, Polfus, Jean L. et. al. "Comparing Traditional Ecological Knowledge and Western Science Woodland Caribou Habitat Models." *The Journal of Wildlife Management* 78(1):112-121; 2014; DOI 10.1002/jwmg.643.
[5] Retrieved from https://stateofchildhoodobesity.org/on-the-navajo-nation-one-farm-works-to-heal-the-land-and-the-people/, no original photo credit given.
[6] Skeet, James. "Regenerative Reclamation… Walking in a Sacred Manner." https://covenantpathways.org/regenerative-reclamation-walking-in-a-sacred-manner/
[7] *After 200 Years: Photographic Essays of Aboriginal and Islander Australia Today*. Jenny Taylor, Ed., Aboriginal Studies Press for The Australian Institute of Aboriginal Studies, 1988.
[8] https://www.bbc.com/news/world-australia-67110193
[9] Indigenous languages of Australia map. Credit: Indigenous Languages Illustration by David Foster (fostertype.com). This map is based on the AIATSIS map of Indigenous Australia, © AIATSIS 1996. For more information about using this map please visit aiatsis.gov.au
[10] *Seven Sisters Songline* by Josephine Mick, Pipalyatjara, 1994. See https://cdhr-projects.anu.edu.au/songlines/resources/
[11] *Dreamings: The Art of Aboriginal Australia*. Peter Sutton, Ed., 1988. ISBN 0-8076-1201-4
[12] https://deadlystory.com/page/culture/Life_Lore/Songlines, accessed 15 October 2023.
[13] Note that the number of *places* represented in a Songline may far exceed "Dunbar's Number," which latter suggests a cognitive limit of to the number of *people* with whom one can have stable social relationships (roughly 150, according to Dunbar). Dunbar, R. I. M. (1992). "Neocortex size as a constraint on group size in primates". *Journal of Human Evolution*. 22 (6): 469–493. My collaborator and partner Rob Tow suggests that, for Paleolithic humans and likely those proto-hominids that preceded them, knowledge of *places* was of greater survival value than relationships with *people*, where bands or social units encompassed, perforce, relatively fewer individuals than places were personally known.
[14] Chatwin, Bruce. *The Songlines*. Viking Penguin, Inc., 1987.
[15] The "grippees" were invented by researcher Steve Saunders. The materials cost of each device was about $5, orders of magnitude less expensive than the Data Glove.
[16] Held, R., & Hein, A. (1963). Movement-produced stimulation in the development of visually guided behavior. *Journal of Comparative and Physiological Psychology, 56* (5), 872.