Timeline

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In this Issue:

Building a Foundation for Compassionate Intelligence
by Diane Gordon

How important is it for children to be exposed to nature? “Essential,” says Joann Lundgren, a long-time volunteer with the Foundation for Global Community. “The earlier children connect with the natural world, the better for them and for society as a whole”

A parent, grandparent, former teacher and school principal, Lundgren heads a team from the Foundation which offers a course for parents and teachers titled “Children and Nature.” Explains Lundgren: “Allowing the young child to experience the natural world is not just a nice thing to do. It is vital. Children have a basic need to establish a deep emotional connection to the natural world. Until our society recognizes and finds a way to honor this need, the future of our culture—and indeed, the future of all life—is endangered. Children who are denied the opportunity to bond with the Earth are also denied the opportunity to develop a moral compass.

“It is this kind of profound bonding, first with the family and then with the Earth, that ensures that the child by age fourteen will have established a foundation for compassionate intelligence—an intelligence that has the well-being of all life as its guiding principle. It is our job as adults to ensure that our children develop that bond.”

One of Lundgren’s inspirations to create the course came from the writings of Thomas Berry, whose thoughts have appeared often in *Timeline*. Another was a matrix model of human maturation developed by Joseph Chilton Pearce and presented in his book *The Magical Child*. The word “matrix” is the Latin word for womb or origins and is defined as “that within which something originates, forms, or develops.” In Pearce's model each matrix provides a safe secure environment, a source of learning. The first transition from the womb and into a new matrix happens at birth, which is where the Children and Nature course begins.

BIRTH TO SEVEN YEARS: BONDING WITH MOTHER AND PRIMARY NURTURERS

Three month-old Tyler is playing quietly in his crib, wriggling his fingers in front of his face and watching the play of light and shadow. His mother enters the room and his whole being changes. His body is on alert, his eyes follow her every move, and he coos, gurgles, and burbles to get her attention. As she turns towards him, smiles, and calls his name, he breaks out into a huge smile, turning towards her and reaching out to her with his whole body. As she picks him up, settles down in the rocking chair, and begins nursing, his eyes never leave her face. She is the center of his universe, as he is hers.

When a child enters this world and all has gone well during pregnancy, a strong bond has already been established with the mother, and the task for the next few months is both to reinforce this bond and to establish the same strong bond with the father and other prime

care givers. It is during the next few months that Tyler, like all babies, will learn whether his world is a safe and trustworthy place. Will his needs be met? Will he be loved unconditionally? Is the family a safe base from which to explore the world, and a safe haven to return to if that big world becomes a little overwhelming? Tyler's mother intuitively understands this. She is attuned to and responsive to his needs, aware of his body language, and makes sure that his world is filled with others who will respond in the same caring fashion. At about seven or eight months, when Tyler begins to crawl, then begins to make his first tentative steps away from his mother, he will do so with assurance. He already knows his world is a loving, caring place and he will have no fears about exploring beyond the reach of his parents' arms. And should it all seem a little overwhelming and frightening, he knows they are there to take care of him. The bond to the primary nurturer is secure. He has entered an exciting new stage which will carry him through the next three years.

Daniel, 15 months old, and his mother Jenny are taking a walk. As Jenny pushes the stroller along the tree-lined street, dappled sun and shadows pass over Daniel's face, making him alternately blink and smile as he tries to touch the shadows with his hands. As they round the corner, they feel a strong breeze, and Daniel lifts up his bare feet and stretches out his toes to let the wind pass though them. He sees the shiny green leaves of a star jasmine and he stretches out his hands to touch them. Then the stroller brushes against some lavender bushes, releasing a rush of perfume. Daniel wrinkles up his nose, sneezes, and lets out a squeal of delight.

Wisely, Daniel's mother does not interfere with his exploration. She understands the child's drive to learn about the world, does not hurry him along, or try to explain or make this walk into a "learning experience." She simply allows Daniel to make his own discoveries, providing opportunities but letting him explore at his own pace. At this age, and until about four years old, the child does not need explanations. He is too busy making his own discoveries and should not be burdened with the imposition of adult attitudes—four-legged furry creatures are cute but six-legged ones are bad! Sand is fine to play in, but stay out of the mud! The ideal role for the adult at this stage is to provide the opportunities—a trip to the beach, a walk in the rain, a creature hunt in the garden— then to step back, alert and ready to move in if invited, or to protect the child from harm. It is important that at this stage parents select experiences that are safe and positive. There will be time later for the child to learn Nature's challenges and respect for her laws. Out of all the many experiences in those first four years, the child forms a personal world view—her world is either safe or threatening; the adults who make up her life are either trustworthy or to be approached with reserve and caution; the wider world, especially the world of nature, is either welcoming and exciting, or a place to be avoided or feared. Hopefully, while maintaining a sensible regard for the very real dangers that exist in the world, the key adults in the child's life are ensuring that her world view is a positive one.

It is important to note that no matter what, the young child is *programmed* to move out and explore the world. The child who views the world as a fearful place will move out cautiously, with a level of anxiety which will limit his experience, while the child who

has developed a positive world view will move out with confidence, whole-heartedly welcoming new experiences.

At four years old, and with an established personal world view, the child enters a new stage. The child who at two years old joyously burst the soap bubbles that his father blew for him, now wants to blow them himself—the biggest bubbles possible. When she was two years old, my granddaughter loved to walk through my herb garden and simply enjoy the mix of smells. At four she needed to sample each individual scent and know the names of each individual plant, then take her father by the hand and share everything with him. By this age the child has learned a great deal about the world and the way it works, is beginning to test that knowledge by asking "Why?" of her surroundings, and is using her imagination in "playing with the world in ways it is not," as educator Bruno Bettleheim phrases it.

At the local park Emma, two years old, is playing happily by herself on the lower rungs of the climbing equipment, oblivious to what is happening just above her head. Another little girl, about four years old, is on top of the climbing equipment, looking down and snarling ferociously at Emma. Concerned, Emma's grandmother asks the older child, "Is something wrong, honey? Is Emma bothering you?" Oh no," said the little girl, "I'm a hyena and she's my prey," and returned to her snarling, never once disturbing Emma.

This little girl, having formed a view of how the world works and obviously having learned about hyenas, was now able to use her imagination, shift the rules a little, and in her own fantasy world turn herself into a hyena living a hyena's domain. I remember when my sister was this age and how she, too, bent the rules. After trailing my father as he worked in the vegetable garden, and watching as he turned the compost heap and disturbed a family of rats, she invented her own special rat family. They, too, lived under the compost heap, but safely in their own cozy little house. They all wore matching black and yellow soccer shirts, they could talk, and they were her playmates for several months!

At this age, from four to seven, if all has gone well, the child's imagination is in full play, and she is developing a sense of delight and wonder as well as the creative abilities that will stay with her for life. The four-year-old has the magical capacity to see the land as an animal does and to experience the sky from the perspective of a flower or a bee. She imagines that with a wave of her hand *she* can make the sun set behind the hills, the stars appear in the sky, the moon to shine. She can be the center of her own created universe. Imaginative play has a fluid quality, moving easily from one "let's pretend" scenario to another, never subject to the rules the adult world may seek to impose. This "let's pretend" play can be pure fantasy—("I'm a hyena")—or imitative, as the child imitates the everyday activities of the adults around him—(pretending to shave like Daddy, going to the store, playing mothers and fathers). By playing these different roles—grownups, or hyenas, or rats in a yellow and black soccer shirt—and seeing the world through different eyes, the child is beginning to develop a sense of empathy.

As adults, we are inclined to dismiss the importance of such unstructured activity, and many preschool children have such structured lives—play dates, dancing lessons, computer activities, watching TV—that there is no time for free play. And this is a great shame, for as most prominent educators would agree, play is the child's work. It is play that prepares the child for adulthood, play that teaches him his place in the world, and play that teaches him how to interact with the world. It is these first seven years that provide the preparation for the next significant transition in the child's life—bonding with the Earth.

BONDING WITH THE EARTH—SEVEN TO FOURTEEN YEARS

At seven years old the child experiences phenomenal neuron growth and enters a period of what might be called insatiable curiosity—he wants to know the why of everything. His mode of thinking changes from magical thinking to the beginnings of logical thinking. And, according to child psychologists, the child moves, ready or not, to bond with something outside the family.

It is a rainy afternoon and in the village school the children, ranging in age from four and a half to eight years old, are engrossed in a story. All except seven-year-old Colin, who is gazing out of the window, watching the rain. Suddenly, he lets out a yell. "Hey everyone, did you know? When it rains, rain comes down? Immediately everyone is at the window, checking out Colin's discovery. "Yes," some of them agree, "it does, but can we go outside to check it out?" So everyone is bundled into raincoats and rain boots and out into the playground. The little ones, the four and five year olds, are happy simply to splash in the puddles or catch the raindrops in their hands. But the older children are embarking on serious scientific discovery. If the rain comes down in one part of the playground, does it still come down at the top of the hill? Or by the gate? And what happens when the rain hits the grass or the concrete path? Is it different? And then what happens? And so these seven- and eight-year-olds are embarking on their own scientific discovery of the water cycle.

In an ideal world this sense of excitement and discovery goes hand-in-hand with a compulsion to extend the ties of affection and loyalty beyond the family to bonding with the Earth and its community of life. But our present culture has experienced a serious alienation from the natural world, making it difficult for us to be in tune with Nature's natural rhythms and to help our children complete that bond. And because the child is fundamentally programmed and developmentally ready to bond with *something* beyond the primary family, he or she will bond with the prevailing culture—materialism and the consumer society, technology, the dominant peer group, or more tragically with the gang, the street, the drug culture. In this environment, children gradually forget their earlier instincts that drew them to the Earth and lose their sense of belonging to something wild and wonderful.

Fortunately there are signs of hope. Many schools, youth groups, and cities do provide opportunities for children to reawaken that sense of wonder in the natural world. But we

need to do so much more. And the most important first step is to reawaken and rediscover our own sense of awe and wonder and learn together with our children.

In addition to making his experience of nature into an all-encompassing scientific experiment, the school age child needs to relate to the natural world in other ways. This should be a time of secret hideouts, tree houses, a special rock or garden nook where he can sit and lose himself in a book or dream the afternoon away—and all in a world free from adult interference. This is also a time to discover what can be done *with* the Earth—planting a garden, swimming in a stream or the ocean, finding and keeping lizards and bugs, capturing fireflies, collecting rocks, watching and naming the birds in the garden. By the time a child is ten or eleven years old and has been given these opportunities to explore and interact with nature, he or she will have developed a love for the Earth, an empathy for living things, a respect for natural laws, and a sense of competence in dealing with the world.

At about eleven years the child experiences another spurt of brain growth, which is accompanied by a passion for learning and a passion for exploring new ideas. And he is ready for new challenges.

When Mike was twelve years old, his parents sold their home, bought a small ocean-worthy boat, made sure the whole family knew how to sail, and set out on a round-the-world journey. Mike's job was to map out their route in advance and to learn something about each country they were to visit. He was also expected to take his own turn at the wheel and to share night watch with his parents. Two years later Mike came home with the knowledge that he could meet any challenge and others could depend on him. He had weathered ocean storms, steered the family through 15-foot waves, and learned a new respect for Nature's challenges.

Not every young adolescent can take to the ocean as Mike did, but each can be encouraged to meet the challenges of camping, or rock climbing, or back-packing in the mountains. It is important to emphasize again that at this age adolescents are *programmed* to seek challenges; denied access to the natural world, many will seek their challenges in ways that can be unhealthy and destructive.

As the parent of any teenager knows, the other drive at this age is a compulsive one toward autonomy. This is not always an easy time for either parent or child. But if the child's experiences though the formative years have been rooted in the natural world, that sense of autonomy will also incorporate a profound reverence for all life and a desire to give back to the world. The child will have forged a positive foundation for a compassionate intelligence.

Between 14 and approximately 21, the adolescent has a need to establish an identity—to know who he is and how he fits into the larger world. If successful, the young person feels secure and comfortable within himself and is able to take a stand with peers.

From now on, the ages when transitions take place are less definite, but the progression stays the same. Pearce calls the next transition the Mind-Brain Matrix—the time to learn to integrate the opposites in one's self. The ability to do this takes a great deal of discipline and knowledge. A sense of wholeness and balance is the reward.

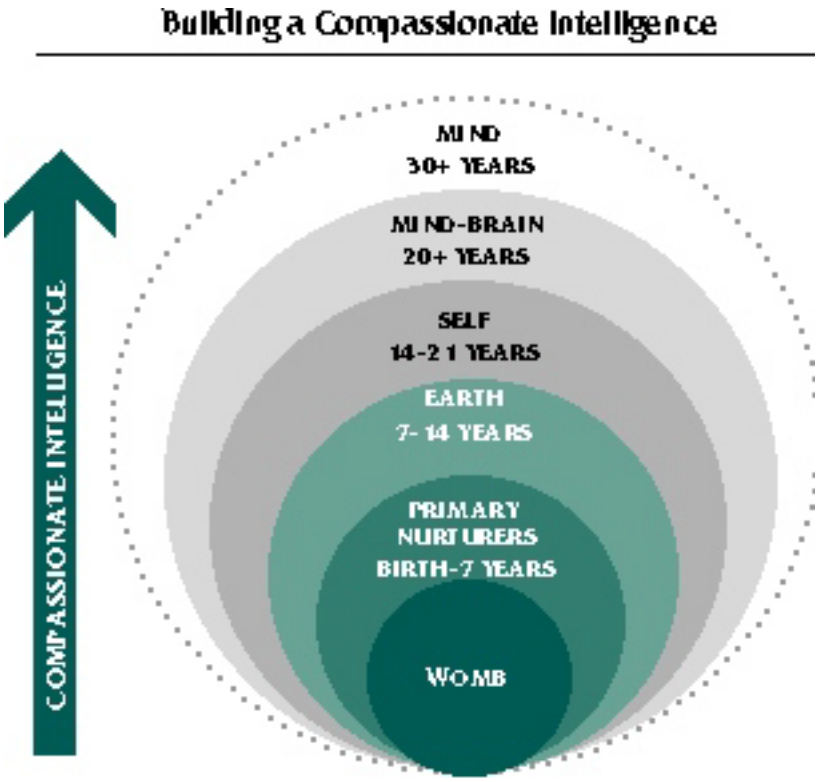
The final matrix is the Mind itself. The challenge now is to be in charge of the mind, to keep it focused on the present, to attain the still place where I can know that I am one with all mystery and all of life. With this knowledge, one finds a place to give back to society. Life has meaning. The capstone of the journey is a Compassionate Intelligence, the coming together of heart and mind for the benefit of all life.

Diane Gordon, who wrote this article, and Joann Lundgren, are co-presenters at the Children and Nature workshops and presentations. Gordon's interest in discovering and sharing the wonders of nature goes back many years, as evidenced by the story that follows this article. Together with other team members, Lundgren and Gordon have given the course to about 250 teachers, parents, and grandparents, as well as to other groups who work with children.
The team has produced a packet of materials that form the basis of the course. It's available for $10 from Foundation for Global Community Distribution Department, 222 High Street, Palo Alto, CA 94301.

Mr. Crow Bird's Summer
By Diane Gordon

He came into our lives one summer's morning. I was watering my garden, when I heard his "Hello." Surprised, I looked around, but could see no one and continued watering. "Hello" again, but again, no one. On the third insistent "Hello," I looked up and saw him sitting on the roof, head cocked: a big black crow.

"Well, Hello," I said, and with a flurry of wings and "Hellos" he landed at my feet. So began what our family calls Mr. Crow Bird's Summer. To my grandchildren Charles and Shayna, then three and four years old, it was pure magic. For meals on the patio Mr. Crow Bird had his own place at the table, and would eat from our hands. When everyone bundled into the hammock to read stories, he would perch on my husband's shoulder, from time to time interjecting his own limited comments—"Hello" and "Shut up." When we walked to the corner store for ice cream he would join us—flying ahead, then looking back and urging us on with an encouraging "Hello" or an occasional "Shut up." He had obviously been someone's pet, now returned to the wild and living with the flock of crows nesting behind our house. But for now he was our Mr. Crow Bird, and his summer with us became a summer of discovery, exploration, and possibility.



Valley of Heart's Delight

A Report by Susan Stansbury

Silicon Valley, formerly blanketed with now-vanished fruit orchards and produce farms, was once widely called the "Valley of Heart's Delight." Blessed with some of the most fertile soil on the planet, the valley has seen more than 95 percent of its agricultural land paved over, built on, and otherwise "developed." Food to feed this large, high-tech, urban area is now imported from near and far. Yet the question arises: Is this system of feeding people sustainable over the long-term?

In response to this question, the Foundation for Global Community has a new project whose name, the Valley of Heart's Delight, is a reminder of Silicon Valley's (and humanity's) agricultural roots. This effort grew out of a Foundation-sponsored weekend

retreat two years ago where a group of community leaders working towards social and environmental change met to discuss the future of the San Francisco Bay Area. How could we work together in new ways to bring about a sustainable future? Many attendees were meeting for the first time, and although they worked on different issues, they quickly realized that they shared similar perspectives about what works in our society and what needs systemic change. Our food and agriculture system emerged as one of the problem areas, so a number of participants formed a Valley of Heart's Delight team and set to work.

VALLEY OF HEART'S DELIGHT PROJECT

The project goes to the core of two big environmental challenges—dependence on fossil fuels and diminishing agricultural land. The team set a long-term goal to find creative methods of growing more food locally and decided on four approaches:

- Reconnect those living in the Valley with the sources of their food.
- Increase the amount of food grown locally through community-supported agriculture and edible landscaping.
- Assure survival of local farmers, food processors, and outlets by increasing the perceived value of locally grown food.
- Encourage sustainable agricultural practices.

To grow more food locally, the team decided to focus on increasing the number of home food gardens, helping create school and community gardens, and encouraging corporations to use some of their landscaping for food production. Subteams were formed to work on the details of these plans and form partnerships with community organizations, neighborhood groups, schools, and businesses.

A few corporations in the San Francisco Bay Area already have community gardens, but the idea of edible landscaping is relatively new. Nonetheless, the team contacting businesses has found that, in general, the idea of edible landscaping is appealing to their corporate staffs. The immediate target is to find companies who are designing new landscaping, and might be ready to implement the idea. Meanwhile, the team is encouraging the concept with city planners who review all new development and landscaping plans.

To inspire more people to grow their own food, the team organized a June tour of home food gardens. Each of the six gardens emphasized a different point, illustrating how food can be grown in a variety of settings. One garden stretched alongside a small driveway, the sunniest spot on the property. Another was a back- yard mini-orchard with 40 different kinds of fruit trees planted close together to provide a year-round variety of fruits. A third was part of an elegant designer-landscaped edible garden, and a fourth demonstrated how to exclude deer and gophers.

While each of the gardens was unique, the owners all had a common interest not only in using organic methods, but also in experimenting with new crops and new techniques.

"You'll learn by doing," was their recurring message. Over 170 people formed car caravans and rode bikes to make the tour—twice as many as the organizers had expected.

Another successful event was "Grow Your Own," a one-day gathering which attracted 150 local home gardeners to share their know-how and set up neighborhood networks to exchange seeds, produce, tools, and labor. Eighteen mini-workshops featured topics such as worm composting, seed saving, raising small livestock, and permaculture techniques.

Speakers at the event included Claire Cummings, journalist and food editor at listener-sponsored radio station KPFA-FM, who described the broader context of food security: decreasing prices paid to farmers, corporate control of inputs such as seeds, pesticides and fertilizers, and concerns about genetically engineered crops. Bill Nelson and Teri Chantaurai, farmers from Camp Joy, a local Community Supported Agriculture (CSA) farm, gave an inspirational slide show about working with the land. An organic lunch was catered by Jesse Cool, a nationally known chef dedicated to cooking with organic and local food wherever possible.

Rather than relying upon mass production methods, sustainable food growing relies upon knowledge— about plants, soil, and growing techniques. Fostering networks where people can share their knowledge is an important component of the project, and creating community through social events has a deeper purpose than simple sociability. A January potluck dinner included 50 people who came to share good food, learn about the project, and generate new ideas. Attendees signed up for volunteer tasks and offered contacts and resources.

The Valley of Heart's Delight team has been invited to participate in stakeholder meetings sponsored by Santa Clara County and the local Farm Bureau which aim to create a marketing plan for locally grown food. The goal is to build a network of farmers, consumers, and retailers who share a common vision of healthy, abundant food and a healthy planet. The team also plans to hold educational forums to raise public awareness about loss of farmland, local hunger problems, genetically engineered crops, and other food issues, and will actively collaborate with other groups in publicizing each other's food- and garden-related classes and events.

Another major effort of the team has been to seek funding for its various activities. The responses from the foundations the team has contacted have been encouraging, and as additional funds are received, more programs can be added and existing programs expanded.

Although people do miss the beauty of farmlands and the orchards that were once a common sight in Silicon Valley, the long-term problems caused by loss of farmland, soil erosion, and pollution are not high in the public's consciousness. Yet there is a growing movement of people who are starting to pay attention to where their food comes from and how it is grown.

Meanwhile, gardening continues to be a popular pastime, and few would question the superior flavor of produce freshly picked from the garden. After a year's effort, the Valley of Heart's Delight team is even more certain that working toward a sustainable food system is a concept whose time has come.

For more information on the Valley of Heart's Delight project, contact Susan Stansbury at the Foundation for Global Community office, 222 High Street, Palo Alto, CA 94301; by e-mail: sstansbury@globalcommunity.org

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Donella Meadows 1942-2001
by the Editors of Timeline

It was completely unexpected. Her latest letter had mentioned having the flu, being wrapped up in a woolen blanket and listening to opera on the radio.

Then an e-mail message arrived from a mutual friend. "Dana is in the hospital. Bacterial meningitis." And over the next few days: "She's in a coma." "A blood clot." Then, "Life support is being withdrawn." And finally, "She's gone."

Readers of *Timeline* have come to know this incredible woman as a writer of unusual perception, expression, and compassion. She was Dr. Donella Meadows at Dartmouth, an adjunct professor of environmental sciences, but she was "Dana" to a worldwide circle of friends and compatriots.

In 1972, while at M.I.T., she co-authored *The Limits to Growth* which sold more than nine million copies and was translated into 28 languages. A follow-up study, *Beyond the Limits*, was published in 1992.

In 1981, together with her former husband Dennis Meadows, she founded the International Network of Resource Information Centers (INRIC), also called the Balaton Group after the lake in Hungary where the group meets each year. As the group's coordinator for 18 years, Dana facilitated what grew to become an unusually effective global process of information sharing and collaboration among hundreds of leading academics, researchers, and activists in the broader sustainability movement.

In addition to her many original contributions to systems theory and global trend analysis, she managed a small farm and was a dedicated member of her local New England community.

Dana was recognized as a Pew Scholar in 1991, received an honorary doctorate from the Swiss Federal Institute of Technology in 1992 and a MacArthur Fellowship in 1994.

In 1997, Dana founded the Sustainability Institute, which she described as a "think-do-tank." The Institute combines cutting edge research in global systems with practical demonstrations of sustain-able living, including the development of an ecological village and organic farm in Hartland Four Corners, Vermont.

If multi-tasking was a dictionary entry, it would have to read, "see Dana Meadows." People who were aware of only some of her regular routine would say, "I don't know how she does it." In addition to everything else, she found time to write a column that was published weekly in many newspapers in the United States and other countries. Her column was nominated for a Pulitzer Prize and appeared regularly in *Timeline.*

Four members of this Foundation were privileged to participate last summer in a weeklong workshop at Whidbey Island, Washington, with Dana, Vicki Robin, co-author of *Your Money or Your Life*, and Miriam MacGillis, lecturer, teacher, and co-founder of Genesis Farm. Dana explained systems theory, Vicki talked about the changing economic paradigm, and Sister Miriam helped us explore the current world view and a new cosmology based on the writings of Thomas Berry and Brian Swimme. Watching these three women interact and share their perspectives was a rare experience. Little did we know then that it would be our last encounter with Dana.

She described herself as "an opinionated columnist, perpetual fund-raiser, fanatic gardener, opera-lover, baker, farmer, teacher and global gadfly." Those who knew Dana Meadows, either in person or through her writing, would call her "a profound thinker, a free spirit, and a beautiful example of what it means to be a human being."

For those who would like to read more of Dana Meadow's articles, visit the website of the Sustainability Institute at www.sustainer.org.

Memorial donations may be made to The Sustainability Institute, P.O. Box 174, Hartland Four Corners, VT 05049

Earth Odyssey: Around the World in Search of Our Environmental Future

A Book Review by Susan Stansbury

W e have all heard numerous dire predictions of rapidly approaching crises in the global environment. But reports on global warming, acid rain, population explosion, and nuclear contamination tend to be abstract at best, leaving most people with only a vague notion of what, if anything, can be done. It is difficult, indeed, to get a clear understanding of issues that aren't directly a part of our daily experience.

This dilemma prompted author Mark Hertsgaard, a prominent journalist, to embark on a journey around the globe. Hertsgaard spent seven years visiting nineteen countries in search of a full understanding of the global environmental picture. Was the human race really in danger of extinction? What are people's attitudes about the environment around the world? Earth Odyssey is a captivating travelogue addressing these questions. His interviews with people all around the planet put a human face onto each issue, and the compilation of scenarios spells out very clearly the need for swift, compassionate, and innovative solutions worldwide.

In China, Hertsgaard is accompanied in his travels by his interpreter Zhenbing, an economics instructor at a major university in Beijing. Hertsgaard quickly learns that this successful man with a keen sense of humor grew up living in abject poverty like the majority of Chinese. Living in a climate where winter temperatures drop to 30 degrees below zero, Zhenbing did not own a pair of shoes until he was fourteen. Burning straw was the typical way of providing warmth in his neighborhood's small huts, yet a sheet of ice often formed on the interior walls. Although coal burning blackens the skies of many Chinese cities, causing horrific pollution and illness, for most Chinese warmth is more important. There is no easy solution to the tradeoff between heat and blackened skies. Gaining some perspective on the realities of their existence makes it easier to understand why the focus of the Chinese is not on clean air or water. The chapter is cleverly titled "Is your stomach too full?" a Chinese saying meaning, if you have time to worry about the environment you must be very well off.

In his visit to the former Soviet Union, Hertsgaard traveled to Mayak, the center of the Soviet nuclear industrial complex. Foreign scientists recently gave it the onerous distinction of being "the most polluted spot on Earth." Although the toxic pollution is far worse than Chernobyl, neither the U.S. nor the Soviet government wanted to raise public concern about it. From 1949 until 1956 the military dumped nuclear waste directly into the Techa River without notifying tens of thousands of people who lived downstream. In 1957 a nuclear waste dump exploded, sending two million curies (units of radiation) into the air and contaminating the entire Chelayabinsk region. Within eighteen months, all the pine trees in a twenty square kilometer area died. A third disaster struck in 1967 in the form of a cyclone that took radioactive silt from Lake Karachay, another body of water that had become a dumping ground, and spread five million curies of waste across fifteen thousand square miles. Medical officials were not allowed to tell their patients what was killing them and the government did not send in basic medical supplies to help alleviate the problem. "It was unpleasant, but I had to conform," said Dr. Mira Kossenko who was the head of the oncology department. "When [the patients] asked me what was wrong with them, I simply told them there was something wrong with their blood...[T]alking about radiation sickness was considered to be revealing a state secret, and I would have served seven years in prison."

However bad some situations are, the addiction to the automobile is taking the biggest toll on the environment throughout the world. From the destruction of ecosystems and

cultures for oil extraction to the emission of greenhouse gases, people's love for the automobile causes by far the most global damage. Within two decades, Bangkok paved over their canals and dismantled their tram system in a race for modernization. Traffic jams are consistent twenty-four hours a day, so that often people would arrive at their destinations faster by walking than by driving. However, as in most industrialized nations, everyone complains about the traffic, yet no one is willing to get out of his car.

Polls in the U.S. showed most people would give up light bulbs and telephones before their automobile. It is part of the culture, a symbol of the American dream, part of people' s identity.

And there is no real alternative. Our infrastructure is built for the auto-mobile and it is often challenging at best to get around on public transportation.

Needless to say, Hertsgaard' s book gives readers a heavy dose of reality. However, his talent is such that he is able to weave these facts into a prose that carries the reader through like a fast-paced novel. He manages to package our predicament with a message of hope by offering us informed choices. In most places he visited, people were concerned about the environment, and polls reflect that there is widespread and growing willingness to pay for environmental protection.

He points out that there is plenty of money to invest in solving our environmental problems if we can get past the fallacy that the economy and the environment are diametrically opposed. Energy efficient products and design can vastly improve our effect on the environment without jeopardizing our basic comfort. Innovations can create a whole new market that is for the most part untapped. Hertsgaard argues that "restoring our embattled environment could become the biggest stimulus program for jobs and business in history." In what he calls the "Global Green Deal," we can rally citizens and governments alike to make the changes needed. We need only to make that commitment.

Earth Odyssey:
Around the World in Search of Our Environmental Future
by Mark Hertsgaard
Broadway Books. New York, 1998. $26.00

Blips on the Timeline

The term "blip" is often used to describe a point of light on a radar screen. Gathered with the assistance of Research Director Jackie Mathes, here are some recent blips which indicate positive changes toward a global community.

GeekCorps

Ethan Zuckerman was a dot-com company founder and millionaire when he had the idea for the GeekCorps, a volunteer group of techies and technology business professionals who would travel to foreign countries and teach e-commerce and technology. Working around the clock for one year, he and his partner, Elisa Korentayer, set up a nonprofit organization and assembled a staff. They got some seed money, and put six figures of Zuckerman's money into the project. An ad placed on one technical Web site attracted 150 applicants for overseas volunteer duty. Last September, GeekCorps' first group of volunteers went to Ghana for three months. Each was matched to a specific company. They worked for free, with the promise that the company will put money into a community project. Cost per volunteer: $12,000. Zuckerman's goal is to have 500 volunteers working in 15 countries within five years

Solar Independence

How many people live off the grid by generating their own electricity? No one knows precisely. "They are very hard to find—they don't pay electric bills," said Richard Perez, editor of Home Power: The Hands-on Journal of Homemade Power. Perez estimates that at least 8,000 families in California and 45,000 nationally are providing their own power. Solar installers, especially those in California, report a surge of callers and applicants since January. The cost of a solar system for a family of four ranges from $14,000 to $20,000, depending on the power needed. "I knew what is happening was coming," said Dale Glaser, a solar-powered home owner in California, about his state's power crisis. "It's about taking responsibility. You become the power plant."

Help for nonproliferation

Ted Turner, the founder of CNN, has donated $250 million to bankroll an organization devoted to stemming the proliferation of nuclear weapons. Heading the new organization, the Nuclear Threat Initiative, is former Georgia Senator Sam Nunn. "There's a tendency among arms control organizations to put all the premium on arms control," said Nunn, "I think the issue is much broader than that." He has in mind a program like one he and Senator Richard G. Lugar, Republican of Indiana, began a decade ago to help the former Soviet Union dismantle nuclear arsenals. Despite $5 billion spent by the U.S. since 1992, "There is still a large gap between the threat and the response," said Nunn. He also envisions helping the World Health organization finance a global early warning system for biological crises and possibly a venture capital fund to help scientists in Russia channel weapons expertise into peaceful commercial uses.

The Precautionary Principle

It's time to invoke the "Precautionary Principle" (see Timeline, May/June 2000), say a group of scientists from the U.S., Europe, and Asia, in a series of papers published in the International Journal of Environmental Health. They

warn governments not to wait for full scientific proof before acting to eliminate chemicals that they suspect to be harmful. "From tobacco to asbestos to agent orange, governments have been faced with explosive revelations that early warning signs had been ignored and that risk had been seriously underestimated," said Carl Smith, Vice President of the Foundation for Advancements in Science and Education. "Rather than merely finding fault with this operating basis, these scientists have offered some guidelines that could prevent similar mistakes in the future."

SUGGESTIONS INVITED

We are always on the lookout for interesting subjects for Blips on the Timeline. Readers are invited to send articles or clippings indicating positive change to Jackie Mathes at the Foundation. If we use your suggestion, we'll automatically extend your subscription for a year.

Human Natures: *Genes, Cultures, and the Human Prospect*

A Book Review by John Bennett

If experts were more aware of evolutionary processes, they would have known that bacteria and agricultural pests could develop the resistance to antibiotics and pesticides that we are now seeing.

This is one of the examples that Paul Ehrlich cites in his latest book, *Human Natures: Genes, Cultures, and the Human Prospect*, to illustrate the book's theme: Both biological and cultural evolution in humans must be studied if awe are to prevent the devastation of our earth by blind adoption of technological innovations without first learning to anticipate the consequences. Knowledge of how we as a species evolved, how we as societies have shaped one another and our environment, and the contrast between biological and cultural evolution may help us avoid adverse effects on—even perhaps extinction of—ourselves and other life forms.

The opening chapters review the human biological evolution that is based on information carried in our genes. However, Ehrlich argues that though genetic instructions are of great importance to the development of our natures, they are not destiny. While the human brain is an outstanding product of evolution, the number of synaptic connections in the human brain far outnumber the number of connections that can be "programmed" by the action of genes. This "shortage" of pre-programmed genes is one reason human infants and young children are so helpless: They "wire" their brains as they mature, enabling them to adapt and learn far beyond their hereditary endowment.

The book provides a comprehensive review of general data on biological evolution. Sample observations:

- From a genetic perspective, race distinctions are false. There are just as likely to be greater genetic differences between individuals within a particular "racial group" as there are between individuals in different groups.

- Human brains appear to have evolved to solve problems of people living and communicating in small communities. We still tend to have a limit of about 150 friends and acquaintances.

Later chapters focus on the influence of our cultural environment:

- Culture is the non-genetic information that is shared and exchanged through socially transmitted behaviors, beliefs, and institutions.

- The agricultural revolution allowed humans to have time for cultural constructions—cities, states, arts, and science, for example.

- Cultures probably first developed when our animal ancestors formed small living groups of hunter-gatherers. The structure of our brains, the practices resulting from intense social interaction, and human language capability have all co-evolved through the influence of such communities.

- The importance to humans of "territorial bounds" may be a culturally evolved phenomenon related to our unique ability to create social groups (neighborhoods, clubs, etc.), each with its own rules for conventional behavior.

We are now at an evolutionary stage where the environment is increasingly shaped by human activities rather than by nature. Understanding the interactions of the relatively slow evolution of biological capabilities and the rapid evolution of cultural processes is important for our future and the future of all life forms.

Ehrlich uses the plural term "human natures" in order to emphasize the critical diversity (resulting from both genetic information and cultural influence) needed for survival of the human species in response to rapid change. As technology brings us closer to being "one world," there is a danger in assuming one human nature rather than multiple human natures—we may underestimate the influence of culture and place too much emphasis on "genetic inevitability." Just as biological diversity throughout nature allows life to adapt to changing conditions, diversity in cultures may preserve qualities that will help humanity survive such changes.

Our individual behavior is highly affected by the culture in which we grow up. Ehrlich offers many examples of how our cultural evolution has led to activities that may destroy us as a species, such as:

- Our capability to develop and use the synthetic chemicals, that are now affecting genetic survival.

- The interaction between the inherited biological drive for reproduction and cultural values favoring many children- leading to severe population pressure.

The most serious threats now faced by humanity may be the slow, deleterious changes in the environment not immediately noticed by our perceptual systems as they have evolved. And we now have the power, through ignorance and/or misplaced ethics, to destroy the ecosystems that support us and the rest of bio-diversity.

In this regard, making the effects of our actions "visible" is important. If the sky turned green from the presence of excess carbon dioxide, for example, people would be much more supportive of remedial action. The visual impact of television has great potential for building needed awareness, but it will be challenging to find ways to counter the millions of dollars spent on fostering excess consumption.

There are no easy answers to the big questions Ehrlich poses about how to achieve the cultural changes needed for preservation of our earth's life-support systems. However, it is clear that knowing which aspects of human nature(s) are primarily genetically based (reproduction, quest for food, attention to kinship) and which are evolved through our experience of culture (consumption of goods, association of power and money) will be important in responding effectively.

Human Natures: *Genes, Cultures, and the Human Prospect*
by Paul R. Ehrlich
Island Press/SHEARWATER BOOKS,
Washington, D.C., Covelo, CA, 2000
$29.95

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"*Timeline* is an uplifting and awesome read." Madison, Wisconsin

"Thank you for this excellent, unique and inspiring publication."
Washington, D.C.

“I cannot write to you without, first of all, telling you how much I look forward to receiving each issue of *Timeline.”* Boulder, Colorado

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Mankato, Minnesota

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"I sent gift subscriptions to our local library and my daughter's school." Chicago, Illinois

"Between *Timeline* and National Public Radio I am given hope in what seems like a very chaotic world."
Philadelphia, Pennsylvania.

"An excellent publication."
Courbevoie, France

Obviously, we enjoy receiving comments like these, But our reason for printing them in this issue is to remind you that Timeline *is read and appreciated by people in many parts of the world and to encourage you to consider sending $10 gift subscriptions to your friends and associates in order to expand our circle of readers.*

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Palo Alto, California
April 20, 2001