

Developing an Earth-bound culture through design of childhood habitats

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The biological health of the planet and the health of the world's children are interdependent. Together they form a single ecosystem under the potential influence and protection of the social construct of sustainable development. Childhood is the most critical stage in the human life cycle. A small but growing body of research indicates that daily experience of nature, spending time outdoors in the fresh air and sunlight, in touch with plants and animals, has a measurable impact on healthy child development. Children have a right to develop in an environment that stimulates their healthy development as mandated by the UN Convention on the Rights of the Child. To fulfill this mandate, nature must be seen as an essential component of the experiential world of childhood, designed into every childhood habitat, providing daily immersion in nature, putting children in close touch with the biosphere. In the urban world we live in, implementation of this right cannot be left to chance. It is a design imperative.

Designing childhood environments for sustainable development

From the day they are born, children must begin learning the most important truth that the biosphere is our sole source of life support: air, water, sunlight, materials to construct shelter from climatic extremes, fire for heating and cooking, and soil for growing food. More than 30 years ago, James Lovelock expounded the Gaia hypothesis that considers the biosphere to be a self-regulating system sensitive to the principle of life. Like the human body, the Earth has a built-in capacity to recover from stress, but not indefinitely—as the ever-enlarging hole in the Antarctic ozone layer dramatically indicates. In response to the “environmental crisis” (which is really a global government crisis), sustainable development has evolved as a principle which states that actions taken today must not diminish the resource capacity of future generations. Agenda 21 has become the tool for implementing this principle. As we embark on the new millennium, children must learn to use it.

Our global society faces the enormous challenge of conserving the finite skin of life around the Earth for infinite generations to come. There is little doubt that our descendants looking back from the year 3000 will consider the health of the biosphere as the ultimate measure of wisdom of the new, technological, global society now evolving. Sustaining the life of the planet would seem unequivocal as

self-preservation. But global society does not follow such simple logic. Human greed is pitted against Gaia. The challenge for policy makers and designers is to work together to find a strategy to support human love of the planet so strongly that the *Tragedy of the Commons* will be averted.¹ Part of the strategy must be to engage children in the process. They must learn to become defenders of Gaia.

Design professionals and those who work with or advocate on behalf of children, must collaborate to create environments for immersion in nature that are worthy of the Earth. Nature should be considered a critical variable in the design of all childhood habitats, including homes, childcare centers, schools, places of worship, and neighborhoods, and in the many other community places where children go with family and friends: botanical gardens, museums, city parks, etc. Regardless of the type of community where children live, immersion in nature is important for development of the individual child as well as for the growth of a universal environmental ethic. A deep love of the planet that must take root early in life if children are to achieve the highest level of Gaia wisdom.

Daily experience of nature is crucial to healthy child development

Childhood habitats are extremely local. A garden designed for a six-month-old, crawling child does not need to be larger than a few square meters of shady lawn, aromatic herbs, highly textured plants and flowers. The experienced world is within intimate “crawling range.” The great event of learning to walk and reaching toddlerhood multiplies the child’s territory many times; further expanding through preschool and schoolage years. In the critical first year of life, a few square meters of play garden can initiate and nurture a child’s sense of wonder at the changing seasons and constantly shifting natural universe.

A little boy, about ten months old dressed just in diapers, notices a grasshopper on one of the flagstones (the animal is visible because of the figure/ground contrast, which would not be the case on the surrounding lawn). The boy stands there observing for one or two minutes than approaches the grasshopper to try to pick it up. It hops into the grass but the boy visually tracks it, toddles closer. The grasshopper leaps again landing on the top of a log a meter from the flagstone. The child follows, again observing, fascinated, for a minute or two, again approaches too close. This time, the animal hops into the flowerbed and takes more substantial, hidden, refuge (observation log, renovated play garden, August 2000).

Children are born curious.² Through an innate motivation to explore, the strange becomes experienced, familiar, and deeply known through practice and repetition. The purpose of design is to ensure that the necessary stimuli are everpresent in the child’s environment to set this learning process in motion through play. Having discovered the “grasshopper phenomenon” (little, elongated creature with huge, muscular legs, that moves rapidly from place to place), the above child’s perception of the world acquired another increment. This perceptual first step will be reactivated by the next observation of the same or similar phenomena. Perhaps it will be a beetle or a butterfly. The child will observe similar but not identical behaviors and will continue to build a pre-literate understanding of his natural surroundings. He will understand that living things

move from place to place in different ways: hopping, crawling, flying. The perceptual impact of the three-dimensionality of the object, its movement through space, the surrounding fragrance and colors, the movement of air across the skin and through the vibrating vegetation vividly impact his memory.

An adult entering the scene (parent, teacher, play professional, family member) can elaborate the child's wonder by enthusiastically sharing the experience, letting the child know that these are important discoveries. Objects are named, connecting perception to language, building towards a higher order understanding. Experience can be extended through preliterate explorations of a picture book with the child. Counting can start here also: "one, two, three..." hops, flagstones, butterflies, etc. The child begins to understand the world around has quantity.

Direct experience of the real world is crucial to healthy development, learning, and education. Natural environments stimulate play and learning in a special boundless way, repeatedly focusing all the senses working together. According to Ayers' theory of sensory integration, the young child's sensory modalities must be stimulated holistically, otherwise later dysfunctions can develop.³ Piaget, looking at child development from another angle, identified the sensorimotor stage of development. Play garden observations of infants bring his theory alive. The recent findings of brain research reinforce the fact that these stages of early development are genetically programmed and if they do not happen by a certain age, they will not happen later; and furthermore, later stages will be limited or compromised in some way.

Recent Swedish research lends weight to the theory of progressive development. Standardized measures were used to compare the physical development and power of concentration of two groups of children.⁴ One group attended an average Swedish nursery school, the other an "outdoors-in-all-weather" school, which also had a "wild garden" as the outdoor space. The findings were significant; children at the outdoors school reached a more advanced stage of physical development, and acquired stronger powers of concentration. The differences in development can be explained as a consequence of the dependant variables—spending more time outside in a more diverse natural play setting. Both findings can be interpreted as the beneficial effect of strong sensory integration.⁵

Two other differences were also significant. The outdoor children were sick less often (an expected result as children are more likely to share germs in the close quarters of indoors). Also, the play behavior of the outdoor children was more diverse, especially in the effective, imaginative, and creative domains. This result is supported by findings from studies of schoolaged children,⁶ as well as the unpublished findings of current research conducted by the *Natural Learning Initiative* in naturalized preschool settings (www.naturalearning.org). Diversity of play and learning behaviors results from the stimulation afforded by the more diverse natural world.

Daily experience of nature is crucial to a healthy planet

Will the ‘grasshopper child’ grow up scared of nature? We don’t think so. As the annual cycles of nature are experienced, perceptions and understanding will grow and develop—provided there are wise adults available to extend the play and learning process or at least that do not cause harm by letting their own fears affect the children. Appropriate environments (physical settings plus wise adults) will support the development of love of nature, a sense of being part of nature, understanding how nature works, and that humans are dependant on nature.

The process of learning to love Planet Earth must start in the first year of life to achieve maximum effectiveness. But as an educational process, it must continue to develop beyond the preschool years, meeting the challenge of primary school to enhance and extend environmental sensibilities. With education systems in many countries moving on narrowing fronts of mandated curricula and parents concerned about college entry and material success, the bright soul of childhood can become dulled. Without careful nurturing, the motivation of hands-on learning stimulated by curiosity and wonder can become stress and drudgery for children.

A crucial principle is that schoolgrounds are considered as an education resource with as much learning potential as the indoor spaces of the school. Starting in the 1970s, a number of demonstration programs have emerged, notably in Canada, England, Scotland, and Sweden. England has produced many publications on the design, use, and management of urban schoolgrounds.⁷ A ten year effort to naturalize a schoolground in California produced powerful testimony from the children regarding its positive impact on the quality of their lives, social relations, learning, and feelings about school.⁸ The children’s own words are a powerful affirmation of the power of nature in their everyday lives. Similar results are emerging in the testimony of teachers in a current project, Blanche Carter Discovery Park, Southern Pines, North Carolina, USA. Since students started spending significant amounts of time outdoors in an improved environment, teachers say that antisocial behavior has reduced enormously *and* academic performance has improved.

Creating environments that improve the quality of children’s social relationships at school is the first step in motivating the learning process in all academic areas. In the realm of science and technology, futurists predict that the next revolution will be in the biological sciences. One of the most pressing reasons is that according to rough estimates only 5% of the Earth’s species have so far been discovered and described.⁹

Neighbourhoods for healthy child development

Genetically speaking, by seven or eight years old a child should be seeking autonomy by learning to move around the community on their own or more likely in a group of peers. But this is becoming more and more difficult for children; universally, because of the dramatic growth in quantity, size, and speed of both private automobiles and commercial vehicles; as well as the added anxiety

of parents in some countries about social threats (real or imagined) towards their children. In England, a generation ago most children walked to school, now most are driven—a situation that ironically adds substantially to the rush hour traffic density and level of risk to pedestrians. The same conditions apply in the United States where the effort to racially balance the public schools involves children being driven by bus long distances across town.

At the scale of the urban neighborhood, the issue of child-appropriate environments falls into the realm of urban design policy. Compared to a play garden for infants and toddlers, older children should have a vast terrain of exploratory possibilities. Key childhood environmental policy issues emerged from field research conducted in the 1970's and have not changed much since then. Today they are even more pertinent. In approximate order of priority they include:

1. Landscape conservation. There is a critical need (not just for children), to protect and conserve landscape features with high educational and ecological significance (streams, woodlands, hedgerows, mature trees, rock outcroppings, etc.), when childcare centers, schools, and residential neighborhoods are constructed.

2. Preservation of special childhood places. Natural places and some people-made places with unusual characteristics are especially attractive to children. Examples include remnant orchards, old trees, remains of old buildings and structures, “dumps,” former earthworks for mining and other “scars” on the land (as adults would label them). These latter stimulate children as they try to image what happened there. Nowadays, there is a serious issue of potential toxic dumping and possible earlier contamination of places children find attractive.

3. Making streets livable. In the past 25 years, many countries have developed a variety of measures and techniques to “calm” neighborhood traffic. The best known and systematic approach is the “woonerf” concept developed in the Netherlands.¹⁰

4. Urban wildlife management. Interest in this task has grown in the past two decades and is a focus of urban policy in some countries. Schoolgrounds and childcare centers should be managed as urban wildlife reservations. In the U.S., the National Wildlife Federation has developed successful programs on both Schoolyard Habitat and Backyard Habitat creation and conservation.

5. Rough ground. Urban wildlife and children both appreciate diverse habitats of unkempt natural areas where they can feel free and interact with nature without annoying adults by making mess in more manicured areas.¹¹ This is especially an issue in urban parks where there is a tendency to follow only adult aesthetic desires for orderliness. Alternative models exist in some countries: the ecological parks in England and the Netherlands, play parks in Stockholm, nature parks in Denmark and Germany.

6. Access to diversity. Implementation of the above five policies will ensure meeting the most critical childhood landscape criterion: access to diversity.

Effective child development is dependent on richness of experience. Convenient, feasible access to diverse natural landscapes is the requirement.

Creating an Earth-bound culture

This paper is a call to address the need of children, of all children, for immersion in nature as a pro-health measure for both children and planet. We must look at health now from a different perspective. In post-industrial society, life-threatening communicable diseases have been almost eradicated. In the Northern Hemisphere, child mortality has been greatly reduced from these traditional causes, although they are still a reality in much of the developing world. Post-industrial society must now combat health threats that society has brought upon itself: stress, violence, sedentary lifestyles, and the many issues around food and nutrition. To counteract these health issues, children's lifestyles must be guided by the pro-health direction offered by everyday immersion in nature. In this way, the health of the planet will be protected by the highest wisdom of the human species.

Landscape designers have a critical role to play in helping create environments worthy of children and of the Earth. The International Convention on the Rights of the Child has existed for more than ten years as the vehicle for addressing the universal right of all children to environments to support their maximum potential.¹² To address this right, landscape designers must intervene in children's environments, involve children in the process, and create the necessary diversity of experience of the natural world to empower children as individuals to create a new, biologically wise society.

We see the figure of the child who stands before us, with his arms held open beckoning humanity to follow.¹³

Notes

¹ See Hardin, G. 1968. "The Tragedy of the Commons." *Science* 162: 367-381.

² Hodgekin, R. *Born Curious: New Perspectives in Educational Theory*. London: John Wiley.

³ See Ayers, A.J. 1979. *Sensory Integration and the Child*. Los Angeles: Western Psychological Services. Briefly, the theory of sensory integration assumes that perception of reality is strengthened when all the senses are simultaneously stimulated so the child acquires a "whole picture" of reality. In sensorily deprived environments, where sensory stimulation is partial, perception is weak and the child's images of the external world are disjointed. Thus, the child can become confused and disconnected from reality. See Ayers, pp. 5-11, for more information.

⁴ Original study by Grahn, P., Mårtensson, F., Lindblad, B., Nilsson, P., and Ekman, A. 1997. Published in Swedish. For a brief summary in English, see Dahlgren, L. and Szczepanski. 1998. *Outdoor Education: Literary education and sensory experience*. Kinda Education Center, Linköping University. This publication reports briefly on the Grahn, et al, study along with additional significant Swedish research studies demonstrating the positive correlation between nature and health and well-being.

⁵ Ayers, 1979. op. cit.

⁶ See for example, Moore, R. & Wong, H. 1997. *Natural Learning: The Life History of an Environmental Schoolyard*. Berkeley, Calif: MIG Communications.

⁷ Learning Through Landscapes is the principle organization. Contact them at www.ltl.org.uk

⁸ Moore & Wong, 1977. op. cit.

⁹ See *Whole Earth*, issue 102, Fall 2000. Special section on All Species Inventory.

¹⁰ Vernez-Moudon, A. 1987. (Ed). *Public Streets for Public Use*. New York: Van Nostrand Reinhold.

¹¹ Moore, 1986. op. cit.

¹² United Nations. 1989. Convention on the Rights of the Child. New York: UNICEF.

¹³ Montessori, M. Presentation, July, 1939. Quoted by Stephenson, M. 2000. The First Plane of Development. *The NAMTA Journal* 25, (3), p.38.