# Children, Technology, and Nature Awareness

George K. Russell

The fact that children are spending less and less time in nature—and some not at all—is not only a tragedy for individual children, but for the future of our species. For this contact is so important for psychological and spiritual development. When I think of my childhood, I remember spring bulbs pushing up pale shoots through the dead leaves, spiders in the garden carrying tiny babies on their backs, the scent of violets and honeysuckle, and the sound of the wind rustling the leaves as I perched for hours in the branches of my beech tree. It was that magic of childhood that shaped the passion that drives me to spend my life fighting to save and protect the last wild places on the planet.

– Jane Goodall, PhD, DBE,
UN Messenger of Peace

In July 2014 the Myrin Institute published an anthology of 12 essays under the title *Children and Nature: Making Connections*. As a contributor and editor of this collection, I hoped the book would find its way into many hands because of what I perceived as a profound disconnect between young (and not so young) people and the world of nature. I had come to see the widespread immersion by so many into a world of hand-held devices, computer games, and digital images as a basic form of addiction, a behavior leaving little time for regard or attention to what is real, especially phenomena of the living world. And as a teacher of biology undergraduates for many years, I gradually found it mistaken to expect that young students of biology would come to university with a thorough background and understanding of natural history or an acquaintance with the basic biology of plant and animal life out of direct personal experience.

Several important works came to my attention. Richard Louv's *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder* concluded that children no longer play out-of-doors – those who do are a kind of endangered species. The Kaiser Foundation survey in 2010 found that the average American child spends almost eight hours on a screen each and every day. (Today's statistics are surely higher.) And more recent studies, although anecdotal, suggest that many young people cannot identify or characterize common flowers, song birds, or local animals. Within this context it seemed essential to collect a series of essays that would assist others—parents, teachers, environmental educators, young people themselves—in addressing a fundamental existential challenge.

From these reflections came *Children and Nature: Making Connections* and the question, "How can we help young people form living connections with the natural world?" The aim, above all, was the matter of connections—direct experience of the living world, practical hands-on projects in nature, gardening, and working with animals, literature, and the arts, and more. As I hope this essay will show, the consequences of "nature deficit disorder" for young people and for the world we live in, especially the natural world, can only be described as dire.

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This essay is adapted from my introductory segment in *Children and Nature: Making Connections* (2014, The Myrin Institute, Great Barrington, MA 01230). This book is available from Myrin at www.myrin.org or through amazon.com. All quoted passages, except as otherwise noted, are drawn from essays in *Children and Nature*. Passages from *The Sense of Wonder* are under copyright protection © 1956 by Rachel L. Carson and are reprinted with permission.

In my many years of university-level biology teaching, I regularly met young people whose chief interest was the study of cellular and molecular processes, but who had little acquaintance with living nature and little or no inclination to study the life sciences in a more holistic manner. There were always exceptions, and our departmental course offerings in ecology, vertebrate zoology, and animal behavior regularly attracted students with interests in field-based studies and the biology of whole organisms. And I was always heartened to find an occasional student who had spent many years of childhood outside in nature or one who had once tended vegetable gardens and hatched butterflies. But my long experience with students concentrating in biology and a wide variety of non-majors was that many had little meaningful experience of the natural world. I am seriously troubled by what I came to see as a deep gulf between the interests and inclinations of so many young people and the living world.

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At the heart of the matter is the notion that direct personal encounter with nature, and the attendant feelings of wonder and delight, form the basis of a genuine ethos for protection of the natural environment. We will honor and preserve what we have come to love and admire, and such feelings find their source in personal experience. But what of those for whom there is little or no connection with nature? Can we expect them to participate with enthusiasm in the search for solutions to the vast array of environmental problems confronting us? And are we losing sight of the idea that each person has the possibility of finding in the many wonders of nature an opportunity for self-renewal and inspiration?

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My approach in teaching, whenever possible, was to introduce an admixture of natural history into my several courses, including definite assignments in the close observation of living nature in whatever ways I could arrange. We were not able to visit the rainforests of Amazonia or Yosemite National Park, but we made ample use of local habitats, the university campus itself, and what the ecologist David Ehrenfeld has termed "the rainforests of home." Whatever successes I had as a teacher convince me that students will take a deep interest in the study of the living world, both inside and beyond the classroom, if they are guided to an authentic encounter with living plants and animals, natural settings, and the enchantments of life itself.

I soon discovered that concern for my own students had far broader implications. In 2010 a thorough and far-reaching study by the Kaiser Foundation reported that the typical young person in this country (age 8 to 18) spends, on average, 7 hours 38 minutes each day on some sort of screen (hand-held, video, TV, etc.)[1.] (The Director of Kaiser declared that this amounts to more than a full-time job!) This leaves no time for quiet immersion in a natural setting, no time to play in nature, no time to experience the tides or the vicissitudes of the weather, or the comings and goings of wild animals, or the resurgence of life in the spring. Recent surveys show that many young people in this country can identify numerous corporate logos but cannot name or describe even five species of songbirds, local animals, or common flowers. And one recent study goes so far as to state that many youngsters spend as little as five or ten minutes each day observing

or attending to even the simplest of natural phenomena. I have known students who spend virtually no time at all in such activity and who appear to be largely estranged from nature.

The essays in *Children and Nature* were compiled with the aim of awakening in readers the wish to assist young people by showing them what lies outside their front door or in a local park or nearby woodland. Then true nature experience would begin to replace what can increasingly be seen as a powerful form of addiction, a dependency on text messages, e-mails, videos, and a torrent of unreal, virtual images. In sum, a fundamental challenge stands before us: How can we wean young people from their devices and begin to address the malaise of a widespread indifference to nature?

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A foundation stone of the effort is Richard Louv's seminal book, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder* (2005), and the nationwide movement he has inaugurated and inspired. Louv asserts that profound nature experience is a "spiritual necessity" for the growing child, but that the youngster who plays outdoors, like the Florida panther and the whooping crane, has become a kind of endangered species, in his words the "last child in the woods." A fourth-grader in San Diego put the matter very succinctly: "I like to play indoors better 'cause that's where all the electrical outlets are." Richard Louv quotes the naturalist, Robert Michael Pyle, who asks poignantly: "What is the extinction of a condor to a child who has never seen a wren?" and Louv looks to the future with concern asking, "Where will the next generation of stewards come from?" Included in the anthology are Louv's thoughtful reflections following the publication of his book and the series of talks he has given to parent groups, teachers, outdoor educators, young people, and concerned citizens. The movement to which he has contributed so much is often referred to, appropriately, as "No Child Left Inside." *Last Child in the Woods* was published over ten years ago, and since then Louv has authored two more books, *Nature Principles* and *Vitamin N*. Each book, especially *Vitamin N*, provides numerous suggestions for ways to help children and their families make meaningful connections, and I recommend to all parents and teachers that they consult the Children and Nature Network (www.childrenandnature.org) for edification and inspiration, and, above all, to gain assurance that there are hundreds if not thousands of grassroots groups in this country helping young people experience and work with the living environment.

My particular focus was and is to identify significant readings that highlight various elements of the issue and bring these to the attention of young people, concerned teachers, environment educators, parents, and all those who see the need for a vast change in the way we raise and educate our children. The articles offered in *Children and Nature* were tried and tested with university students, especially those who are about to enter the field of teaching, and I was pleased to find many individuals who, in full sympathy, recognized both the need and the challenge.

Lowell Monke, one of the contributors to *Children and Nature*, was a computer sciences teacher in the public school system of Des Moines, IA, for some years and subsequently taught prospective teachers as a member of the Department of Education at Wittenberg University in Ohio. His long experience as a teacher of computer sciences showed him both the value and the challenges of an increasingly computer-bound age. Monke has been a singular voice in showing that, for every positive argument put forward in favor of computers in schools, there is a hidden, unrecognized loss.

He argues that the digital screen cannot begin to simulate the direct experience of nature that Richard Louv reminds us is so essential for the proper growth and development of the child. "Children come to know a tree," Monke writes, "by peeling its bark, climbing it branches, sitting under its shade, jumping into its piled-up leaves. Just as important, these firsthand experiences are enveloped by feelings and associations—muscles being used, sun warming the skin, blossoms scenting the air. The computer cannot even approximate any of this." I note with delight that "The Human Touch" is reprinted in this issue of the *Research Bulletin*. To my mind, this piece should be required reading for parents, teachers, and all those who care for the future of children and the future of the natural world.

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Personal experience lies at the very heart of the matter. Individuals who are fortunate enough as children to have had profound connections with all that nature offers—plants, animals, wild places, natural rhythms, the sky and weather, and much else—will have a firm foundation that can extend throughout their lives. Scott Russell Sanders's moving account of his relation with his son speaks directly to this theme. In "Tokens of Mystery" Sanders writes that "if a child is to have an expansive and respectful vision of nature, there is no substitute for direct encounters with wildness. This means passing unprogrammed days and weeks in the mountains, the woods, the fields, beside rivers and oceans, territories where plants and beasts are the natives and we are the visitors."

David Sobel, author of "Look, Don't Touch: The Problem with Environmental Education," has made numerous and substantial contributions to the field; his study, *Beyond Ecophobia: Reclaiming the Heart of Nature Education*, is widely cited and admired. His other books and articles carrying themes relating to "place-based education" are well known. In "Look, Don't Touch" he reminds us that childhood experience in nature is all-important in establishing lasting bonds between individuals and the natural world. He writes that John Muir, E.O. Wilson, Aldo Leopold, and Rachel Carson all had "down-and-dirty experiences in childhood" that formed lifelong bonds with the earth and its creatures. Sobel tells us that "nature programs should invite children to make mud pies, climb trees, catch frogs, paint their faces with charcoal, get their hands dirty and their feet wet." Too much emphasis on concepts and the mechanical principles of nature, especially in the early years, does little to establish the sort of deep communion with nature to which he alludes. "Between the ages of six and twelve, learning about nature is less important than simply getting children out into nature." A recent book by Sobel and several collaborators, *Nature Preschools and Forest Kindergartens: The Handbook for Outdoor Learning*, highlights an effort, originating in Europe, to bring children into nature at very early ages; several schools in this country, especially the Forest Kindergarten at the Waldorf School of Saratoga Springs, have achieved remarkable success.

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The most powerful voice of all is that of Rachel Carson. She is best known for her seminal work, *Silent Spring*, a book that helped to launch the environmental movement in the early 1970s, but she is also the author of "The Sense of Wonder," a lyrical essay she wrote a few years before her death in 1964. This article is

currently under copyright protection and could not be reprinted in the anthology, but I must urge readers to locate the work and judge its value for themselves.[2] "The Sense of Wonder" has been widely acclaimed as one of the great American nature essays; it deserves full attention from everyone concerned for the future of the natural environment and the future of our children.

Carson spent her summer vacations at a cabin retreat along the coast of southeastern Maine, where she found repose and the inner strength to confront powerful voices not wanting to hear her message about toxic chemicals and poisoning of the natural environment. In "The Sense of Wonder" she helps the reader both to recapture something of lost childhood and to reflect on the sense of wonder that each child brings into life as a kind of birthright. Readers of this essay will be profoundly affected, I think, and I trust that each will come to value even more the power of nature to awaken our hearts to its beauties and wonders. Rachel Carson has alerted us to what we are doing to the natural environment; she has also shown us how in nature we can find sustenance for the human spirit.

> A child's world is fresh and new and beautiful, full of wonder and excitement. It is our misfortune that for most of us that clear-eyed vision, that true instinct for what is beautiful and awe-inspiring, is dimmed and even lost before we reach adulthood. If I had influence with the good fairy who is supposed to preside over the christening of all children, I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength.

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Surely we must pay far more attention to the role of parenting and the need for caring adults to foster compassion and love in children, especially during the formative years of early childhood. Pattiann Rogers writes in "Cradle" that "I cannot think of anything more important for the future of the earth than that we have loving, diligent mothers and fathers caring for our children…If children learn to act with compassion by being treated compassionately themselves, if they learn to love by being loved, to respect others by having received respect, to cooperate by being involved in cooperation, to keep their word by experiencing honesty, to protect others by having been protected themselves, how can we possibly overestimate the importance of children being nurtured by dependable parents who are capable of demonstrating such qualities? It is these qualities that will form the basis for all future decisions our children must make regarding their interactions with other people and with the natural world."

One of the most troubling aspects of our theme is that children seem to have forgotten how to play. Stephanie Hanes writes in "Toddlers to Tweens" that for many if not most American children "free play" no longer exists. Youngsters are programmed and scheduled, tested and retested, given little or no recess time at school, and pressured to get ready for higher levels of education. They have little or no experience of the joys of wandering, the vagaries of fantasizing, or the simple pleasures of made-up games, unscheduled days, and the carefree delights of summer. Hanes writes that "children's play is threatened, and kids—from toddlers to tweens—should be relearning to play. Roughhousing and fantasy feed development." The matter of children's play is a serious concern for parents, teachers, and child psychologists throughout this country. Many current books, popular magazines,

and academic studies attest to this concern, and readers will likely be able to suggest titles of their own. I offer Gary Paul Nabhan and Stephen Trimble's *The Geography of Childhood: Why Children Need Wild Places*; Susan Linn's *The Case for Make Believe: Saving Play in a Commercialized World*; Scott Sampson's *How to Raise a Wild Child*, and the highly relevant publications of the Alliance for Childhood. The issues underlying these accounts and many others must find their way into the heart of current educational discourse, and they deserve our closest attention.

Along a similar vein, "The Privilege of Gardening with Children" by Carolyn Jabs, an important inclusion in *Children and Nature*, speaks to the matter of children and the soil. Young people who cannot recognize various types of wild flowers, songbirds, or species of ornamental trees and shrubs will not have planted seeds, harvested vegetables, or picked apples. Jabs offers helpful, practical suggestions for how parents can guide youngsters in the planting of and caring for a garden. Most importantly, she informs us that "children have a deep and abiding interest in growing, perhaps because they are doing it themselves. They remind us, if we let them, that the point of gardening is not a perfect platoon of well-disciplined plants. Rather, it is the privilege of witnessing a miracle as simple, profound and unpredictable as growth itself."

Most of my direct acquaintance with primary and secondary education is through Waldorf schools, and I am aware that many have made gardening and, where possible, the care of animals an important part of the curriculum. Waldorf schools in Harlemville, NY; Kimberton, PA; Garden City, NY; Hadley, MA; and the Summerfield Waldorf School in California have each instituted exceptional programs in gardening, and there are others, equally important, that could be cited. I urge readers to examine the website description of the Summerfield curriculum where it is evident that most young students working their way through the 12 years of this program will likely emerge as individuals deeply connected to and concerned for the well-being of the land and committed to its preservation (www.summerfieldws.org/the-farm/). Children who spin wool, collect cow-pies, and build compost piles in the lower school, plant and harvest vegetables, care for farm animals, and work with natural materials in middle school, and undertake projects in sustainability in high school will surely be different from young people educated to the ordinary standards of public education. (I am aware that there are important projects going on in various public schools around the country, and I have no wish to belittle these efforts, only to point out the value of what I have learned from Waldorf education.)

There are further considerations. Douglas Sloan, Emeritus Professor of Education at Teachers College, Columbia, writes that children's "simply being in nature is not enough. If nature is to nourish children, and they in turn are to protect and nourish it as adults, imaginative capacities for feeling and perception must be brought to birth in childhood. Here the influence of word, story, poem, and all the arts become of crucial importance. They work with nature in awakening imagination. The confidence and capacity to meet and care for life are called forth by an education suffused with the beauty and forces of life." In this spirit we included two articles in the anthology: James E. Higgins's "Words Full of Wonder," an essay on the value of children's literature and the influence of adults who share stories with a child, and Richard Lewis's piece on "A Wilderness of Thought: Childhood and the Poetic Imagination," a wonderful account of poetry and the children who write it.

It is beyond the scope of this article to explore the place of drama, poetry, and the arts in education, but the role of children's literature deserves further exploration and commentary. As a child I read a great deal and a favorite book was *The Curious Lobster* by Richard W. Hatch. The curious lobster's thoughtful musings and his

adventures with Mr. Badger and Mr. Bear have lived with me ever since childhood. The book has no environmental message, and it makes no plea for conservation or animal protection. It deals only with the life of Mr. Lobster, a fictional character I came to love, and to this day I cannot order lobster meals in restaurants. I wonder how many other books of childhood have helped to shape my attitude and a sense of respect and compassion for animal life.

My parents grew up in very different parts of the country: my mother in the Bronx, my father in rural North Dakota. But both were exposed to the same texts at some point in their schooling, the nature essays of John Burroughs. These short essays highlight and celebrate simple happenings in nature, implicitly inviting readers to explore and make observations of their own. And it is an educated guess that Anna Botsford Comstock's classic volume, the *Handbook of Nature Education*, and Thornton Burgess's *Bird Book for Children* may have influenced my parents' young lives.

**If a child is to keep alive his inborn sense of wonder,… he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement, and mystery of the world we live in.**

Sara St. Antoine, herself an author of many splendid books for children, has been exploring the range of contemporary children's literature for some years, and her observations lead to important suggestions for young readers and the adults who guide them to appropriate selections. Noting a decline over the last two decades in children's books that simply portray natural places or animal life, she writes:

> We didn't have a lot of books about environmental problems when I was a kid. The stories that really nurtured my connection to nature were simply ones where a landscape and its inhabitants came alive. I wanted to experience vicariously the wind on the prairie, the waves on the seas. I wanted to see what badgers or lions looked like up close and contemplate their daily routines, their wild spirits. On some level, I'm not even sure these had to be real ecosystems and real species.[3]

St. Antoine's book suggestions for young adults include such works as *An Owl on Every Post* by Sanora Post, *The Red Pony* by John Steinbeck, *Winterdance* by Gary Paulsen, and *Lord of the Rings* by J.R.R. Tolkien. Early readers are directed to *Grasshopper on the Road* by Arnold Lobel, *Henry and Mudge and the Starry Night* by Cynthia Rylant, and *Mouse and Mole: Fine Feathered Friends* by Herbert Yee. By her standard these books are as much a part of the corpus of environmental literature as any books directly treating environmental issues and those who deal with them. (My own list includes all of Beatrix Potter, the several books about Babar and Celeste, and my favorites, *Freddy the Pig* and *Uncle Wiggily*.)

I leave the final words for Rachel Carson who speaks to the major theme of this collection. When asked by parents how they can teach youngsters about the natural world when they themselves know so very little about it, her answer was the following:

> If a child is to keep alive his inborn sense of wonder without any such gift from the fairies, he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in. Parents often have a sense of inadequacy when confronted on the one hand with the eager, sensitive mind of a child and on the other with a world of complex physical nature, inhabited by a life so various and unfamiliar that it seems hopeless to reduce it to order and knowledge. In a mood of self-defeat, they exclaim, "How can I possibly teach

my child about nature--why, I don't even know one bird from another." I sincerely believe that for the child, and for the parent seeking to guide him, it is not half so important to know as to feel. If facts are the seeds that later produce knowledge and wisdom, then the emotions and years of early childhood are the time to prepare the soil. Once the emotions have been aroused—a sense of the beautiful; the excitement of the new and the unknown; a feeling of sympathy, pity, admiration or love—then we wish for knowledge about the object of our emotional response. Once found, it has lasting meaning. It is more important to pave the way for the child to want to know than to put him on a diet of facts he is not ready to assimilate.

Rachel Carson tells us that "those who dwell among the beauties and mysteries of the earth are never alone or weary of life." But what of those who have little or no contact with the natural world and for whom the beauties and mysteries of the earth have long since disappeared? And what of those youngsters whose lives revolve around cyberspace, technological devices, and virtual images to the exclusion of anything resembling genuine nature experience? Do we not owe it to our young people to address the lessons of these essays with all the determination and strength of will we can possibly bring to bear?

**ENDNOTES**

1. Generation M2: Media in the Lives of 8- to 18-Year Olds, a national large-scale survey conducted by the Kaiser Family Foundation, was released in January 2010. This survey found that the average "screen time" for young people in America was 7 hours 38 minutes each day or 53 hours per week, a figure markedly higher than a similar study done five years earlier. The complete report can be accessed at the Kaiser website, www.kff.org.
2. *The Sense of Wonder* is available from Harper-Collins in a splendid coffee-table format that includes Nick Kelsh's images of the Maine coastline and woodlands. The volume can be purchased through Amazon.com and is available also in Kindle format.
3. https://www.childrenandnature.org/2013/12/07/the-nature-of-childrens-books-this-holiday-give-your-child-the-kind-of-book-that-will-inspire-a-love-of-the-outdoors/

**George K. Russell** *holds a doctorate in biology from Harvard University. His college level laboratory manual,* Investigations in Human Physiology *(Macmillan), shows how to teach biology without the killing of animals. As one of the co-founders of* Orion *magazine, he served as editor-in-chief from 1982–2002. Dr. Russell retired from Adelphi University in 2015 as Emeritus Professor of Biology after a long career in teaching and research. He also served as Board Chair of the Waldorf School of Garden City for 12 years.*