Ecologist Sandra Steingraber

How we're poisoning our children

SANDRA STEINGRABER has been sharing her passion for justice, her scientific knowledge and her concerns about environmental poisons since 1997, when she wrote of her struggle with cancer in Living Downstream: An Ecologist's Personal Investigation of Cancer and the Environment. *Her second book,* Having Faith, *combined an account of her own pregnancy with details about fetal toxicology. In her latest book,* Raising Elijah: Protecting Our Children in an Age of Environmental Crisis, *she describes the personal challenge of raising children in a time of acute environmental stress. Steingraber received one of the 2011 Heinz Awards for her "ability to make scientific research compelling to a wide audience." She lives in Ithaca, New York, and is a scholar in interdisciplinary and international studies at Ithaca College.*

One of the initial responses one has to your books is: "There is so much to worry about." It is hard not to feel despair and anxiety.

Yes, the despair question is the number one question I hear, and it is the biggest obstacle to social and environmental justice. The problems are very serious; our economy has become dependent on ruinously destructive practices. But what often prevents people from insisting that we do things in a more enlightened way is their own despair. They give up hope before they've even started.

I have discovered that laying out the case for harm is not sufficient. My task as a writer is to inspire people to become active. Despair is mitigated by action. This is a place where working with faith communities is particularly gratifying. Because of their history of social justice concerns, churches are often a little less prone to "a case of the vapors" than other groups. If I tell a group that something is a David and Goliath struggle, church groups will see the need to be David. The enormity of the situation doesn't give us permission not to try.

What led you to write *Raising Elijah*?

The book refers to one of my childhood heroes, Elijah Lovejoy, a Presbyterian minister well known to Illinois schoolchildren. In the 1830s, people invested in slaves to keep the cost of goods down and to allow the U.S. to compete in the global marketplace. These were economic arguments for keeping slavery, and they had traction. But when Lovejoy became a father, he saw the experience of slaves in another light: slave children were separated from their parents when they were sold, and he could feel the tremendous human cost. Lovejoy began to argue that slavery was a homicidal abomination that could not be abided. When he was threatened, he said that while he was willing to die at his post, he was not free to step aside. When he was assassinated by antiabolitionists in 1837, he had a two-year-old son, and his wife was pregnant with their second child.

Our economy is now ruinously dependent on fossil fuels. It is a homicidal abomination too, and we must find alternative ways to reimagine our economy. My son, now ten years old, was named after Elijah Lovejoy. He has a history of asthma, which is an environmentally influenced illness linked to exposure to vehicle exhaust and other forms of air pollution. Through my study of environmental science, I have learned that I can't protect my own child without confronting our nation's energy policy and transportation systems and without protecting the plankton in the ocean that produces the oxygen that he breathes.

> "We are exposed to toxins without our consent."

I don't answer the despair factor by minimizing the direness of the situation; I answer by reminding people that there were other times in human history when the situation was dire, and people were called on to do big things. I am not asking people to recycle or change their lightbulbs—people get confused when we ask them to do small things because they intuitively know that the situation requires a bigger response.

History has not judged kindly those who sat by while fascism took over Europe. Those people are called, ironically, "good Germans." But others saw the early signs and took action. How do we want to see ourselves? Will we be good Germans or will we be members of the French Resistance?

How would you sum up the environmental crisis?

I see it as a tree with two trunks. One trunk is chemical trespass: the human rights violations that result when inherently dangerous substances are introduced into our common environment. We are exposed without consent, and our bodies become receptacles for harmful chemicals linked to cancer,

preterm births and fetal damage, among many other problems.

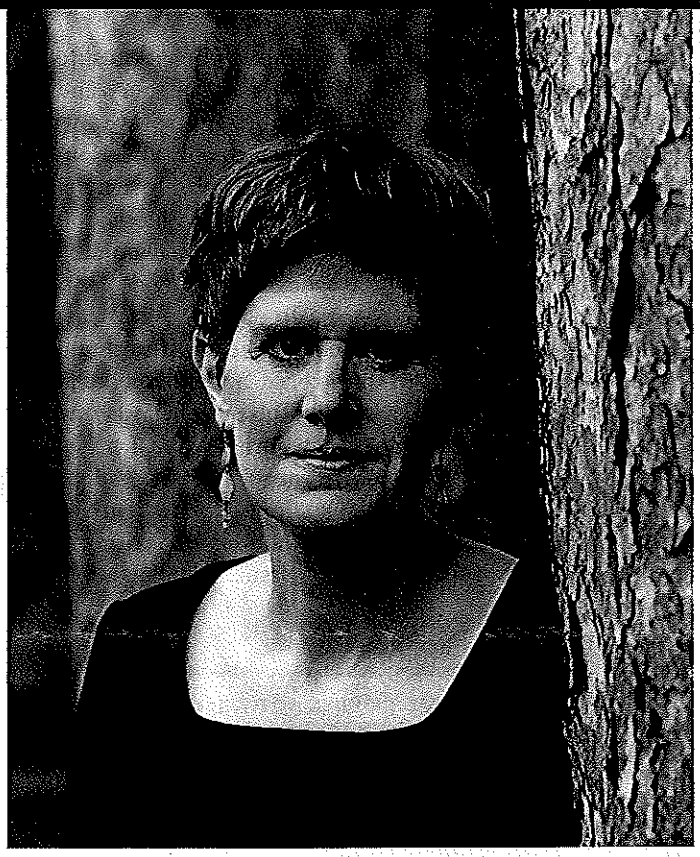
The other branch is climate change. This refers to the burning of fossil fuels that load up the atmosphere with heat-trapping gases, so much so that we are changing the climate system.

These two trunks are often dealt with by two separate groups of environmentalists. I am interested in bringing these two together. The trunks of the tree share a common root in our dependency on coal, oil and natural gas. All of the chemicals in the first category are produced from oil, coal and natural gas. Take vinyl shower curtains. Vinyl is a form of plastic made from vinyl chloride, a liver carcinogen to which workers in PVC manufacturing plants are exposed. Plasticizers are added to vinyl shower curtains to make them less prone to cracking. Plasticizers are linked to asthma, and emerging evidence suggests they also function as reproductive toxicants that can alter the development of the male reproductive tract during prenatal life.

If we could stop digging oil, coal and gas out of the ground and burning them and if we redesigned the energy economy, we would also redesign the materials economy. We often hear about how wind and solar might substitute for coal and natural gas, but renewable energy offers us much more than a different way to get our electricity. If green chemistry and green engineering can redesign the kinds of things we use in everyday life, then we will be addressing the common root of both trunks of the tree.

Are you encouraged by what you see in green chemistry and green engineering?

Biomimicry is an exciting field. It looks at the natural world and observes how the world does things, then derives solutions from what organisms have evolved to do. For example, scientists study organisms that have found ways to move very quickly through water. Using what they've learned, they've developed mechanisms for wind turbines. Another example is studying an organism that has developed ways to use the toxins it produces. Right now, we dump our toxic waste in people's communities, usually the communities of people who are poor and have little political power.



COURTESY DEDE PLATCH

The happiest example is organic farming. This is a tremendous success story. The old thinking was that we had to choose between high yields and poisoning the soil. Happily, that is no longer the case. The best science shows us that yields of organic farms are now on par with yields from conventional farms—or close to it—and organic farms outperform conventional, chemically dependent farms during periods of drought and climatic stress (which we are expecting more of). Organic farming, while still small, is now the fastest growing sector of agriculture, and it continued to grow after the economic downturn.

The other great thing about the success of organic farming is that there is a lot of overlap between the political and the personal. We all eat, and in doing so we can make choices about protecting ourselves and the land around us.

What motivated you to study environmental science?

I grew up in an industrial community in Illinois and was diagnosed with bladder cancer at age 20. The first question the doctor asked me was what environmental exposure to toxicants I had experienced. Had I ever worked in an aluminum smelter? Although I had never worked there, we had an aluminum smelter in my town. I soon learned that bladder cancer is considered the quintessential environmental cancer.

My life as a cancer patient was my entrance point into environmental science. Using a postdoctorate from Harvard, I went back to my hometown, where I uncovered a cancer cluster. One of the many things that struck me was how little the people who were being affected knew about their situation.

What should communities and individuals do?

My philosophy is to never tell anyone what to do as a result of what they learn from me. This has frustrated some readers, but it is crucial that individuals and communities answer this question for themselves. I work with very diverse groups. When I speak to a church group, for example, I do as much listening as I do talking. What are the environmental issues in their communities? What are their communities' passions?

For example, I worked with a college football team to

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reduce the growth of mushrooms on sports fields. Mushrooms are dangerous for players because they are slippery and can cause knee injuries. Conventionally, they are sprayed with a fungicide, which endangers human reproductive functions. We found an alternative. I've worked with fashion designers who want to take on the dry cleaning industry, middle school girls who want toxin-free nail polish, and musicians who are worried about the depletion of tree species that provide the wood for their instruments.

I find that environmental issues can be significant unifiers. I work with both right-to-life groups and Planned Parenthood on powerful chemicals that cause preterm births, the leading cause of death among newborns. While I myself do not subscribe to the right-to-life groups' political philosophy, I recognize the organizations' genuine concern about the sanctity of fetal life. Planned Parenthood is also concerned; it sees this as a reproductive rights issue. Women are being exposed without their consent to chemicals that damage their unborn children.

Recently President Obama overrode EPA protections against smog pollution. What is the impact of this decision?

It is by far the worst decision this administration has made. Smog is formed when airborne chemicals such as evaporating paint fumes or vapors from natural gas wells combine—in the presence of sunlight—with tailpipe emissions from cars or diesel exhaust from trucks to make ozone. Ozone is a triangular molecule of oxygen and is a powerful cellular poison. You

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can't see ozone; when you see smog, the haze is caused by light rays that are bent as the light hits these molecules. Smog is not just a nuisance; it kills people—elders and infants disproportionately. It also has detrimental effects on pregnant women. Asthma, heart disease and stroke are some the effects of smog. It causes misery in families everywhere. In other words, this is not only about the landscape looking smudgy on a hot summer day.

We have the technology to do things differently. Lisa Jackson, the EPA administrator who developed the smog standards, has a background in environmental justice. She is aware that one of the things dragging down our economy is medical care costs—often in those areas related to smog. She worked very hard on these standards and created a great path forward, only to see it thrown away. The administration's rationale was right out of the Tea Party playbook and extremely destructive.

What will be the result of the smog decision?

Children are going to suffer the most. As a parent, it is my job to protect my child from harm. If the air itself is causing my child harm, then I cannot do my job. There is an important tradition in religious activism of speaking truth to power. It is time for that now. But it is also time to speak truth to powerlessness. For me, this means going into communities where people are disproportionately affected and have very little understanding of what is happening. I share the science with them. This gives them power to address these issues in their own communities.

You often draw on religiously inflected language in your writing and speaking, as in *Raising Elijah*. What is your faith perspective?

I was adopted as an infant through the Methodist Church and attended church twice a week. The scriptural passages and hymns are part of how my brain is wired. I went to a Methodist college, but I then left Methodism behind me in a lot of ways. I have found a new spiritual home in the Quaker community. I find a lot of strength in the meetinghouses. I will often come to meeting right from the airport, having spoken

Job's blazon

A blazon is a poetic catalogue of a woman's physical beauty and virtues

My skin sinks in sackcloth.
Worry canyons me with wrinkles.
Gaunt, cleft-hewn, I am a monument
To my defeated,
Dying self.

My voice from my pleas is
Asundered. They are buried
In the mortuary of the dark.

I stumble in the season of night
On a path of briars, biers, thorns,
Pricking me into memory.

My body aches with time.
Every minute consumes endless seconds
As if I were a living cadaver
And the clock a hungry predator
Tearing my grey flesh from
My stale, lime-soaked bones.

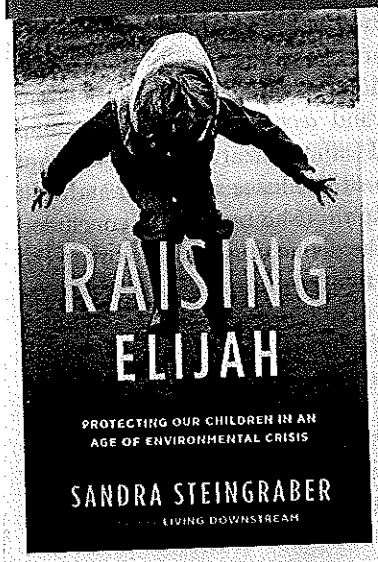
My veins shrink
Life deflated balloons,
Full once, now airless rubble.

Once I loved the sea,
Bathed in its giddy spray,
Tasted its salty liquor.
Today my tears burden
The waves overflowing with
My misery, with my misery.

Philip C. Kolin

somewhere about an environmental issue, and I sit on those benches struggling with the question of what difference my work has made. As I start to worship, I imagine Quakers before me who worked on the underground railroad at great danger to themselves or fought for women's rights or spoke out against nuclear weapons. This sense of history lets me imagine myself as one link in a very long chain of witnesses for social justice. The Friends' credo—faith in action—is at the center of my spiritual life, as is the notion that there exists something of God in everyone, which is the keystone idea that calls Quakers to pacifism. Because environmental destruction harms children and begets violence, working to protect the abiding ecology of the planet on which human life depends seems to me a consistent part of a larger commitment to peace.

We Quakers are called to seek out the sacred within the fellowship of ordinary life. I believe that in any given moment we humans enjoy an exquisite communion with creation, as molecules of our environment stream through us, break apart, rearrange themselves and become our bodies and our blood. Our children are made of air, water and food. The plankton stocks that make us oxygen, the bedrock that holds groundwater, the pollinating bees that make fruit: these are blessings. Chemical poisons should not trespass here.



Raising Elijah: Protecting Our Children in an Age of Environmental Crisis
by Sandra Steingraber
Da Capo Press, 368 pp., $26.00

Let's talk about **toxins**

IT'S TIME FOR THE TALK, says Sandra Steingraber. No, not the talk about the birds and the bees—although as a parent she knows about that one too. It's time, she says, for the talk about the pollutants that are infiltrating our lives and threatening the health of all of us, especially our children. The sex ed talk is actually much like the environmental ed talk, Steingraber says:

> The two tales shared a common epistemological challenge: They are both counterintuitive. In the former case, you have to accept that your ordinary existence began with an extraordinary, unthinkable act. In the latter case, you have to accept that the collective acts of ordinary objects—cars, planes, dishwashers—are ushering in things extraordinary and unthinkable.

Among the extraordinary and unthinkable things one learns from *Raising Elijah* is that the pressed wood used to construct decks and playground equipment was, up until 2004, sealed with arsenic. "We can't yet prove how arsenic causes cancer and diabetes," writes Steingraber, "but we know that it's involved. And we know that when we test the soil under our kids' playgrounds, we're measuring arsenic at unacceptable levels." Children, who are especially susceptible to toxins, pick up the poison on their hands as it dissolves in the rain.

Steingraber also tells us about mercury and how the burning of coal creates methylmercury (40 percent of industrial mercury emissions come from the burning of coal) and puts mercury into water. A 2009 survey of U.S. streams found mercury in every single fish tested. Mercury in children is associated with loss of IQ, forgetfulness, attention deficits and loss of balance. Instead of stopping production of this poison at its source, we warn pregnant women and children to limit their fish intake (especially tuna). Given the otherwise outstanding benefits of fish as a food source, asks Steingraber, why are we burning coal at all?

Steingraber's first book, *Having Faith: An Ecologist's Journey to Motherhood* (2001), combined a chronicle of pregnancy with reports on toxicology. She continues to write about science in a way that nonscientists can appreciate, interspersing scientific material with snapshots of her family and descriptions of her own efforts to eliminate toxins from the air her children breathe and the food they eat. Her work is on a par with David Quammen's marvelous book *The Song of the Dodo* (a mix of science writing and travel writing) or the medical detective stories of Oliver Sacks. Her chapter titles suggest the liveliness of her approach: "Pizza (and Ecosystem Services)" and "Homework (and Frontiers in Neurotoxicology)."

It's still a frightening read. I was tempted to put the book down several times but kept returning because of the author's passion not only for the health of children but for the intricacies of nature, the human body and family life.

Once you've heard "the talk" from Steingraber, you can begin to sort through the befuddling mess of chemical pollution with increased confidence and courage. You'll also know how to make some immediate changes in your lifestyle. Start gardening. Air dry your clothes (a clothes dryer sends 1,369 pounds of carbon dioxide a year into the atmosphere; drying clothes indoors in winter adds humidity to the air). Switch to a manual, non-gasoline-powered lawnmower and call the work aerobic exercise. Become an advocate for the environment and fight with Steingraber for measures that reduce the toxins in our food, air, water and playgrounds.

—*Debra Bendis*