

Cancer and social life

Review of *Living Downstream: An Ecologist Looks at Cancer and the Environment*, by Sandra Steingraber

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Living Downstream: An Ecologist Looks at Cancer and the Environment, by Sandra Steingraber, Addison-Wesley, Reading, Massachusetts, 1997

This book appeared two years ago, but it is well worth bringing to the attention of those readers of the WSWs who are not familiar with it. *Living Downstream* is one of the first works to deal comprehensively with the growing body of evidence linking cancer to environmental contamination. It is a compilation of scientific studies and analyses, as well as newly released cancer registry data. Meticulously researched, the book is narrated by an ecological scientist who has lived through the horror of a cancer diagnosis. Thus the mass of evidence is presented both scientifically and personally.

Sandra Steingraber is a biologist, a poet and a cancer survivor. The book begins by paying tribute to Rachel Carson, the wildlife biologist, whose groundbreaking *Silent Spring* was published in 1962. That work discussed the poisoning of the environment, as well as the connivance of governments and many scientists in relation to the extent and effects of chemical pollutants. Carson sounded the alarm about many harmful substances, such as DDT, whose registration was only revoked in 1972.

In *Silent Spring* she wrote, "I do contend we have put poisonous and biologically potent chemicals indiscriminately into the hands of persons wholly ignorant of their potentials for harm. We have subjected enormous numbers of people to contact with these poisons, without their consent and often without their knowledge." Felled by breast cancer in 1964, Carson left unfinished work on the influence of industry, such as chemical companies, on the direction of medical and scientific research.

In *Living Downstream* Steingraber compares data on environmental toxicity and data on cancer incidence. "Few long-term, comprehensive studies on the environmental links to human cancers have been conducted--and I leave it to readers to judge the reasons for this neglect. However, the many small-scale, underfunded, and sometimes preliminary investigations that do exist create a startling picture when viewed together."

Steingraber's book makes a powerful case, which can only be hinted at here. She notes that an important indicator of the connection between cancer and environmental damage is the rise in cancer incidence over time. At mid-century a cancer diagnosis was the expected fate of approximately 25 percent of the American population. Today cancer strikes 40 percent of the population (38.3 percent of women and 48.2 percent of men). The biggest upsurge has taken place in the last two decades and has hit all age groups, from infants to the elderly. Overall, cancer is the second leading cause of death and the leading cause between 35-64 years of age.

Another indicator of the role of environmental factors is the increase in cancer incidence among successive generations. The occurrence of melanoma (the most deadly type of skin cancer) rose 350 percent between

1950 and 1991 in the US; mortality rose by 157 percent. Between 1982 and 1989 alone, melanoma incidence jumped 83 percent. Melanoma is increasing at an annual rate of 4 percent and the age of diagnosis is going down.

The types of cancer that are galloping out of control also indicate evidence of environmental attack: after lung cancer in women, those growing most rapidly are melanoma of the skin, non-Hodgkin's lymphoma and multiple myeloma.

Melanomas are associated with exposure to ultraviolet radiation. The Environmental Protection Agency (EPA) projects that tens of thousands of additional fatal skin cancers will result from the 5 percent loss of ozone that has occurred above North America. Lymphomas are consistently associated with exposure to synthetic chemicals, especially a class of pesticides developed by the military in 1942 known as phenoxy herbicides--the most famous being Agent Orange. Steingraber documents the evidence which associates the phenoxy herbicides with non-Hodgkin's lymphoma. Exposure to radiation has been recently linked to the surge in cases of multiple myeloma, which is also associated with exposure to a variety of chemicals, most notably benzene. "Bone marrow. Lymph nodes. Skin. From the body's dark tunnels to its sunlit surface, cancers of all kinds are presenting themselves with increasing frequency. Melanoma, lymphoma and multiple myeloma are simply traveling at especially high velocities," she writes.

Steingraber spends some time discussing the group of chemicals known as organochlorines, formed by the chemical marriage of chlorine and carbon atoms, which represent some 50 percent of the synthetic materials recognized as endocrine disrupters. Almost universally, chlorine and carbon do not coincide in the natural world. To force the two together, elemental chlorine gas is required. A powerful poison, chlorine gas was first introduced in World War I, but its use grew exponentially during and after World War II.

According to Steingraber, the military demands of World War II were the catalyst, from an ecological viewpoint, in transforming a carbohydrate-based economy into a petrochemical-based economy. Simply put, products previously derived from vegetation were now manufactured from oil. "Dioxin is a beautifully symmetrical molecule, consisting of two chlorinated carbon rings held together by a double bridge of oxygen atoms ... dioxin has been linked to a variety of cancers and is now believed to inhabit the body tissues of every person living in the United States"

As the reader progresses through the diverse and frightening statistics, often summarizing regional and global data, a picture emerges of the accumulating threat to the human condition. The cascade of research documentation is interspersed with insights into the emotions and psychology of a cancer victim, the hellishness of the cancer battle, the inhuman nature of the treatment, the depressing merry-go-round of "getting well in preparation for becoming sick in an attempt to get well."

Her close friend Jeannie Marshall, to whom the book is dedicated, did not win the battle against the disease. The author movingly describes Jeannie's final days: "Time had become such a strange commodity in the preceding month. On the surface, it had seemed to speed up as the vague progression of Jeannie's various symptoms had suddenly accelerated. One day she found she could no longer type. A week later she could not turn doorknobs. The next week, buttons were impossible. Each loss was profound and irrevocable--the ability to write, to walk through a doorway, to undress ... the whole concept of time was unbearable."

Science measures the impact of cancer statistically; a cancer patient has different barometers. Even the most routine aspects of the disease are traumatic. "Nothing slows time down as much as waiting for lab reports."

"Like a jury's verdict or an adoption decree, a cancer diagnosis is an authoritative pronouncement, one with the power to change your identity. It sends you into an unfamiliar country where all the rules of human conduct are alien. In this new territory, you disrobe in front of strangers who are allowed to touch you. You submit to bodily invasions. You agree to the removal of body parts. You agree to be poisoned. You have become a cancer patient.

"Most of the traits and skills you bring with you from your native life are irrelevant, while strange new attributes suddenly matter. Beautiful hair is irrelevant. Prominent veins along the soft skin at the fold of your arm are highly prized. The ability to cook a delicious meal in thirty minutes is irrelevant. The ability to lie completely motionless on a hard platform for half an hour while your bones are scanned for signs of tumor is, conversely, quite useful."

Steingraber addresses herself to the thorny issue as to whether cancer is primarily inherited or acquired. She contends that a cancer cell is "made, not born," and "arises through a series of incremental changes to chromosomal DNA." These alterations can be inherited, but the vast majority, she argues, are acquired during one's lifetime when originally healthy genes become damaged. These mutations are associated with different kinds of cancer. "Body Burden" is a term used to denote the total of all cumulative environmental exposures and involves all routes of entry (inhalation, ingestion and skin absorption) and all sources (food, air, water, workplace, home, etc.). Some 177 different organochlorine residues can be identified in the body of an average middle-aged American man.

Every cancer patient experiences the manner in which the medical community places great importance on heredity. Oncology patients are always asked in detail about their genealogy, a legitimate concern, but they are rarely, if ever, queried about their environmental histories. (Steingraber points out the remarkable fact that cancer registries in the US are not funded to collect occupational histories!)

She writes: "Even when rare, inherited mutations play a role in the development of a particular cancer, environmental influences are inescapably involved as well. Genetic risks are not exclusive of environmental risks. Indeed, the direct consequence of some of these damaging mutations is that people become even more sensitive to environmental carcinogens."

"Cancer incidence rates are not rising because we are suddenly sprouting new cancer genes. Rare, heritable genes that predispose their hosts to cancer by creating special susceptibilities to the effects of carcinogens have undoubtedly been with us a long time.... The inheritance of a defective carcinogen-detoxifying gene would matter less in a culture that did not tolerate carcinogens in air, food and water."

In the book's final chapter, Steingraber challenges the conventional wisdom that individual responsibility is the key to cancer prevention. Typical of literature found in hospitals, clinics and waiting rooms is a US Department of Health and Human Services brochure, which admonishes: "You can control many of the factors that cause cancer.... You can decide how you're going to live your life." By contrast, a scientific textbook, *Human Genetics: A Modern Synthesis*, asserts: "Reducing or eliminating

exposures to environmental carcinogens would dramatically reduce the prevalence of cancer in the United States." (Steingraber notes that in 1832, during a cholera epidemic, the New York City medical council declared that those most likely to be the disease's victims were the imprudent and the intemperate.)

The official literature presents the principal cause of disease as lifestyle or behavior. But lifestyle choices are never independent of environmental risks. "Anyone following official dietary recommendations is consuming from one to four servings of illegal pesticide residues every twenty days--or somewhere between eighteen and seventy-two servings a year. This tally does not include illegal residues also received from meat, dairy, eggs, fish or grains.... Rachel Carson once remarked how strange it was to live in an age where carcinogens were a basic element of our system of food production."

Citing the public educational campaigns on breast cancer prevention as the most extreme expression of the focus on personal choice, she remarks that a lifestyle approach is inadequate. Concentration on this effort does not shed any light on the causes of the disease. Steingraber points out that mammography and breast self-examination are not tools of prevention but acts of cancer detection. "The popular refrain 'Early detection is your best prevention!' is a non sequitur: Detecting cancer, no matter how early, negates the possibility of preventing cancer. At best, early detection may make cancer less fatal, allowing us, as the epidemiologist Robert Millikan puts it, 'to live in a toxic soup without breasts or prostates, et cetera.'"

In her final chapter Steingraber makes the following subversive and suggestive comment: "A narrow focus on lifestyle--like a narrow focus on genetic mechanisms--obscures cancer's environmental roots. It presumes that the ongoing contamination of our air, food and water is *an immutable fact of the human condition* to which we must accommodate ourselves" (emphasis added).

This is the heart of the matter. What prevents the public from becoming galvanized over the issue of environmental contamination and its profit-hungry perpetrators is not simply the influence of the powerful corporations involved* or the actions of shortsighted medical professionals, but a social atmosphere in which it is virtually an accepted fact that nothing can be done to improve the human condition. In reality, vast numbers of people know or sense the truth of Steingraber's basic argument, but tacitly accept that cancer is, in effect, one of the unavoidable, if unfortunate, byproducts of modern economic life.

Steingraber advocates what she calls a "human rights approach" to cancer. She observes that "we do not all bear equal risks when carcinogens are allowed to circulate within our environment. Workers who manufacture carcinogens are exposed to higher levels, as are those who live near the chemical graveyards that serve as their final resting place.... When carcinogens are deliberately or accidentally introduced into the environment, some number of vulnerable persons are consigned to death. The impossibility of tabulating an exact body count does not alter this fact."

She notes that even those who dismiss the impact of contamination as negligible and advance the most conservative estimate of cancer deaths due to environment, 2 percent (whereas the genetics textbook the author cites suggests that "90 percent of all forms of cancer is attributable to specific environmental factors"), are acknowledging thereby that 10,940 people die annually in the US as the result of such contamination. This is larger than the number of women who die each year from hereditary breast cancer, more than the number of children and teenagers killed each year by firearms, three times the number of nonsmokers estimated to die each year as the result of secondary smoke--all subjects of national debate and even legislative action. "These deaths," she writes, "are a form of homicide."

Steingraber draws the conclusion that the amelioration of the devastating conditions that she has committed her career to exposing can

be accomplished through education and lobbying. She was appointed to the National Action Plan on Breast Cancer, administered by the US Department of Health and Human Services, shortly before her book appeared. Those of us who draw more radical conclusions from her compelling and disturbing work must view it as further proof of the incompatibility of the unplanned and anarchic profit system with the healthy and indeed continued existence of the human race. *Living Downstream* is strongly recommended.

*Although the role of those corporate giants should not be ignored. In one small bit of black comedy, a controversy erupted when the reviewer of *Living Downstream* in the prestigious *New England Journal of Medicine*, who described the book as "a biased work," was exposed to be a senior official with W.R. Grace, a prominent chemical firm. W.R. Grace was a defendant in the notorious Woburn, Massachusetts pollution case dramatized in the recent film, *A Civil Action*.



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