

Rachel's Environment & Health News
#769 – Prenatal Exposures and Disease
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At last, an ancient problem has been solved.

More than 2000 years ago people knew that the quality of the natural environment affected their health. During the first century B.C., the ancient Roman architect, Vitruvius, highlighted the relationship of environment to disease in his book "De Architectura." [1] However, getting hold of reliable information on the subject remained impossible for more than 2000 years.

Even with the rise of modern science and medicine over the past 600 years, reliable information on environment and disease remained difficult or impossible to lay hands on. Published in obscure journals or books, stored in relatively few libraries, and written in jargon that the public could not understand, good information about environment and disease remained under wraps -- accessible only to a privileged few with special training and special access.

Now the situation is rapidly improving because of two developments:

(1) A "scientific information movement" begun in the 1950s by Barry Commoner and Margaret Mead and their colleagues within the American Association for the Advancement of Science became a broader "public interest science" movement in the 1970s thanks to Ralph Nader and his co-workers. [2] Those pioneering efforts have now engendered two generations of scientists who conduct studies that serve public needs and who translate scientific findings into terms that people can understand so that citizens can make informed decisions; and

(2) The world wide web now allows people almost anywhere to get their hands on reliable plain-language descriptions of scientific and medical studies that link the environment to human disease. Today almost anyone with access to a public library (or a \$500 home computer and a telephone) can tap into a vast body of plain-language information explaining how environmental contamination causes human disease. The most exciting developments in web-based information are evolving as we speak.

In particular, three related web sites now offer daily updates of news stories, scientific studies, and medical reports linking environmental contamination to human disease. See <http://www.environmentalhealthnews.org> and <http://www.protectingourhealth.org/newest.htm> and <http://www.ourstolenfuture.org/New/newstuff.htm> [omit hyphens in URLs].

When you dive into these three web sites, you may find yourself thinking, as I did, "This is why everyone needs access the world wide web!" There is simply no substitute for what these web sites offer. Breaking news stories and current reports, with pictures, and with hyperlinks to background information, provide real depth of understanding. Current-awareness information doesn't get any better than this.

These three web sites are related, but different, so it's good to check each of them often.

The newest of the three is www.environmentalhealthnews.org [omit hyphen]. This one provides breaking news. Every day, seven days a week, you'll find more than a dozen current news stories from around the nation and the world. Furthermore, the site is interactive -- citizens can add their own news, and their own reports. This site is still in the test phase, but it already contains a wealth of information on environment and health.

The other two sites, somewhat older, are truly rich sources of information. The "Our Stolen Future" site, <http://www.ourstolenfuture.org/New/newstuff.htm> [omit hyphen], is focused on studies of hormone-disrupting chemicals and their effects on plants and animals. Using hyperlinks, the site provides explanatory materials that will give you all the depth you could want as you learn about the role of hormones and other biological signaling systems, which can be disrupted by a growing list of industrial chemicals. My description does not do justice to the depth of this site -- to appreciate it, you will need to spend some time there yourself.

The third web site, maintained by CHE (the Collaborative on Health and the Environment) -- <http://www.protectingourhealth.org> [omit hyphen] -- offers a unique resource: peer-reviewed overviews that evaluate the medical literature linking environmental contamination to asthma, brain cancer, breast cancer, childhood leukemia, endometriosis, infertility, learning/behavior disorders, prostate cancer, and testicular cancer. Other overviews of other diseases are in the works. CHE's "peer-reviewed overviews" project has been guided by physician Ted Schettler, whose books have provided convincing evidence that children's mental development can be derailed by exposure to low levels of chemicals in the environment. [3]

Together these web sites represent a phenomenal -- and phenomenally useful -- intellectual tour de force. Many people contribute to these web sites, but the chief architect and driving energy behind all three is John Peterson ("Pete") Myers, Ph.D., biologist and co-author of *Our Stolen Future* -- the book that propelled the scientific community onto its successful search for industrial poisons that can disrupt the fundamental signaling systems that control growth, development, and behavior in plants and animals. [4]

When important new scientific studies appear, Pete Myers often describes them in considerable detail -- how the study was conducted, what it found, its relationship to previous studies and hypotheses, and its scientific limitations. For non-experts concerned about environment and health, this is a unique trove of real treasure.

The web also provides a unique perspective. Browsing a paper library can be slow and tedious. The web is fast and smooth. When you browse a web library, new patterns jump

out at you. Recently, as I was scanning the archives of these three web sites, I noticed that many recent studies have now confirmed that much human disease is linked to prenatal exposures --exposures that occur in the womb. It's as if a gun goes off later in life, but the trigger is pulled before birth. This is a chilling new picture of human disease. To cite but four recent examples:

** A study published in the Journal of the American Medical Association (JAMA) revealed that attention deficit hyperactivity disorder (ADHD) has a real physical basis, and that the disease may well begin in the womb.[5] F.X. Castellanos and colleagues found that children with ADHD have brains that are significantly smaller than the brains of children without ADHD. Furthermore, they concluded that the events initiating ADHD are likely to occur in the womb.

** Lennart Hardell and his colleagues reported in Environmental Health Perspectives in June that there is a strong association between young men who get testicular cancer and the levels of long-lived organochlorine pesticides measurable in their mother's blood (but, importantly, not in the blood of the men themselves).[6] Exposure in the womb seems crucial in the development of many testicular cancers.

** In April, Linda Birnbaum and Suzanne Fenton reviewed a wide array of animal and human studies, concluding that exposure to hormone-disrupting chemicals in early development can cause cancer and/or increase sensitivity to cancer-causing agents later in life.[7] They point out that the danger of prenatal exposures is firmly established in the medical literature, yet few human studies have made use of the information. For example, most breast cancer studies have measured chemicals in the blood of women at the time they were diagnosed with cancer -- probably the wrong time to be looking for a connection between chemicals and cancer, Birnbaum and Fenton suggest. The critical exposure likely occurred many years earlier. If you look for answers during the wrong time-period, you will get wrong answers. (This important study is available in PDF at <http://www.-rachel.org/library/getfile.cfm?ID=182> [omit hyphen].)

** In January, research in two New York City neighborhoods found a correlation between environmental contamination and babies born with low birth weight and small head circumference. Dr. Frederica Perera, the lead author of the study, told the New York Times that the results were particularly troubling because these birth outcomes are predictors of "poor health and mental problems later in life." [8]

If prenatal exposures to environmental chemicals really do give rise to lifelong disease, it means that the present systems for medical care, public health, and environmental protection can never achieve their goals. This should be a profound wake-up call.

If certain chronic diseases (some cancers, some immune disorders, and some diseases of the nervous system, for example) -- many of which are increasing today -- are being caused by run-of-the-mill prenatal exposures, then people must be protected from exposure to disease-producing chemicals even before they are born. Present-day public-health systems are not remotely capable of achieving such a

goal. This is a powerful argument against business as usual, an argument that is unlikely to fade any time soon.

In recent years, corporations that manufacture or use large quantities of industrial poisons have devised two responses to this distinctly-unwelcome new picture of disease.

In the past decade, corporations have spent tens of billions of dollars to inject doubt and uncertainty into the debate about low-level environmental exposures causing disease. Under the present risk-based system, scientific uncertainty creates a "green light" for chemical contamination. So long as the link between exposure and disease has not been proven to a scientific certainty, exposures can continue.

This is why corporate/governmental leaders created our present regulatory system, based on "risk assessment." The risk-based system assumes that we can determine "safe" (or "acceptable") levels of all industrial poisons if we simply study the problem long enough. And until we have completed such studies, contamination can continue because that is what "individual liberty" combined with "free markets" would dictate. (Never mind that corporations are nothing like individuals and therefore should never be accorded the liberties that individuals enjoy -- an argument seldom heard in polite company.[9])

This risk-based approach has allowed the entire planet to become contaminated with potent industrial poisons -- with grievous consequences for wild creatures -- and has allowed chronic human disease to proliferate.

If you want to be reminded of the terrible consequences of this risk-based approach, check daily at <http://www.-environmentalhealthnews.org> [omit hyphen].

If you sit in a quiet place to read these daily reports of contamination and disease, you can hear the hum of the industrial system grinding up the biosphere, day by day. You hear the self-assured voices of corporate officials denying their personal responsibility, claiming there is no alternative, explaining that jobs will be lost if they behave any other way (subtly shifting blame to working people for management's refusal to innovate). In the background, you can hear the monotone murmur of government officials doing their jobs, deflecting public concern with the language of risk assessment: "No immediate threat to health." "Acceptable risk." "Well within the guidelines." And the grinding continues day after day after day.

In recent years, it has become indisputably clear that low-level environmental exposures DO matter, and so a new rationale for business-as-usual was needed. The newest corporate/governmental answer to these problems is "genes." Billions of dollars are now being poured into genetic studies to show that it is our individual susceptibility to disease that must be fixed -- not the industrial poisons that attack our genes to cause disease.

The fundamental idea behind this genetic approach is that we can continue to flood the environment with exotic disease-producing chemicals because we will be immunized against harm by expensive improvements to our genetic heritage.

Or, alternatively, we will be cured of disease after it occurs -- again, by expensive rearrangement of our genes.

The very latest corporate "solution" is nanotechnology, whose advocates assure us that environment-related diseases such as cancer will one day be cured by tiny "nanobots" -- infinitesimally small machines designed to motor through our arteries and identify (and then zap) diseased cells.[10] So we should spend billions on nanobot research and forget about the traditional basis of public health -- primary prevention. There is simply no money in prevention.

All these new approaches like genes and nanobots share one common feature: they will all increase our dependence on corporate "experts" who will hold our lives in their hands, for which we will, no doubt, be required to pay dearly. (Those who cannot afford to pay are presumably lazy good-for-nothings whom we can profitably allow to expire, preferably somewhere out of public view.)

But sooner or later the ancient wisdom of prevention seems sure to prevail because the facts are driving us relentlessly toward that necessity. Prevention is really the only affordable (and feasible) solution to medical, public health and environmental problems. Therefore, sooner or later, prevention must prevail.

The European Union is currently trying to institutionalize prevention of harm in its proposed new policy toward industrial chemicals.[11] The E.U. has made the audacious proposal that chemicals should actually be tested to discover their effects on health and the environment BEFORE they are marketed. This precautionary approach is captured in the phrase, "No information, no market."

In response to this common-sense E.U. proposal, chemical corporations world-wide have joined forces to declare all-out war on the E.U.'s environmental ministry, and they have the full force and power of the U.S. government behind them.

The National Journal recently described the U.S. vs. E.U struggle this way:

"The conflict over the chemicals legislation goes deeper than the usual arguments over dollars and cents. The root cause is the E.U.'s use of the so-called precautionary principle. This is a concept, codified in the European Union charter, that government can and should make policy based on the significant possibility of risk, even before all data is compiled. It is on the opposite end of the spectrum from the way policy is usually set in Washington, where the government does not usually pass broad reforms until there is concrete evidence of harm.

"By contrast, the European chemicals policy is pre-emptive, requiring a massive amount of testing in the hope of reducing harm before it occurs.

"Although the costs involved with the chemicals legislation will not be cheap, the European Union argues that the change will pay off in the long run. According to E.U. estimates, the indirect costs of higher chemical prices to European manufacturers and consumers over 15 years would be as high as \$29.3 billion. But on the benefits side, the E.U. estimates that in 30 years, there will be 2,200 to 4,300 fewer cases of

cancer, and savings of \$20.3 billion to \$61 billion in occupational health expenditures." [12]

The chemical industry and the U.S. government are allies in a titanic struggle for their right to continue poisoning people and the planet unabated. Nevertheless, sooner or later, I believe, common sense will prevail and a preventive approach will be adopted everywhere.

I do not think for a minute that it will be easy. Millions -- perhaps many millions -- more people (not to mention wild creatures) will have to live and die with birth defects, cancers, attention deficits, asthma, diabetes, and low IQ before corporations are brought to heel.

Corporations have captured control of our publicly-owned airwaves, harnessed our public universities to satisfy a corporate agenda, seized direction of our federal government's research budget, defiled scientific advisory committees worldwide by packing them with corporate skills, dumbed down our public schools, corrupted our federal courts, and bribed the executive and legislative branches of our government through the simple device of funding election campaigns.

About the only feature of our democracy that corporations have not yet entirely debauched is our right of free speech. And of course they are working on that one, too. Slapp suits and veggie libel laws are intended to silence critics of corporate violence. The best-known veggie libel lawsuit is that of TV star Oprah Winfrey, who was hauled into court by Texas meat mavens, charged with defaming red meat, a crime under Texas law. Winfrey won the lawsuit but it reportedly cost her upwards of \$3 million to do so. No doubt, many a reporter and editor now thinks twice before publishing new information about the many dreadful diseases linked to excessive red meat in our diet. And just last week, Monsanto, the St. Louis chemical bully, sued dairy farmers in Maine who had the temerity to advertise to their customers that their milk contains none of Monsanto's patent-medicine artificial hormones.[13]

No doubt, the assault on our right of free speech is a purposeful, coordinated, long-term corporate strategy, and extremely dangerous.

Yet despite this bleak picture of a world corrupted and intimidated by corporate power, the ancient truth about environment and disease continues to leak out through the cracks in the system. Indeed, on the web, the truth fairly gushes out. This alone is powerful reason for hope. With the creation of new web sites like those maintained by Pete Myers, it IS possible to arm ourselves with information, to resist tyranny. The truth shall set you free.

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[1] Marcus Vitruvius Pollio, "de Architectura libri decem." Much of the Vitruvius text is available at http://www.ukans.edu/history/index/europe/ancient_rome/E/Roman/Texts/Vitruvius/.

In Book 1, Vitruvius wrote,

"Skill in physic enables him [the architect] to ascertain the salubrity of different tracts of country, and to determine the

variation of climates, which the Greeks call klivmata: for the air and water of different situations, being matters of the highest importance, no building will be healthy without attention to those points."

And in Book 2:

"7. Natural consistency arises from the choice of such situations for temples as possess the advantages of salubrious air and water; more especially in the case of temples erected to sculapius, to the Goddess of Health, and such other divinities as possess the power of curing diseases. For thus the sick, changing the unwholesome air and water to which they have been accustomed for those that are healthy, sooner convalesce; and a reliance upon the divinity will be therefore increased by proper choice of situation."

[2] Peter Montague, "Ralph Nader and Barry Commoner: Strategies for Public Interest Research, with Three Original Case Studies" unpublished doctoral dissertation, University of New Mexico, 1971. Available from University Microfilms, Inc. (www.umi.com). The "Introduction" is available at: <http://www.rachel.org/library/getfile.cfm?ID=184> .

[3] Ted Schettler and others, *In Harm's Way; Toxic Threats to Child Development* (Boston: Greater Boston Physicians for Social Responsibility, May, 2000). Available at: <http://www.rachel.org/library/getfile.cfm?ID=183> .

[4] Theo Colborn, Dianne Dumanoski, and John Peterson Myers, *Our Stolen Future* (N.Y.: Dutton, 1996; Plume [paperback], 1997 -- ISBN 0452274141).

[5] F.X. Castellanos and others, "Developmental trajectories of brain volume abnormalities in children and adolescents

with attention-deficit/hyperactivity disorder," *Journal of the American Medical Association* Vol. 288 (2002), pgs. 1740-1748.

[6] Lennart Hardell and others, "Increased Concentrations of Polychlorinated Biphenyls, Hexachlorobenzene, and Chlordanes in Mothers of Men with Testicular Cancer," *Environmental Health Perspectives* Volume 111, Number 7 (June 2003), pgs. 930-934.

[7] Linda S. Birnbaum and Suzanne E. Fenton, "Cancer and Developmental Exposure to Endocrine Disruptors," *Environmental Health Perspectives* Vol. 111, No. 4 (April 2003), pgs. 389-394.

[8] Lydia Polgreen, "Pollution Linked to Low Birth Weights in African-Americans," *New York Times* January 17, 2003.

[9] On corporations, see Rachel's #388 and #582 at <http://www.rachel.org> , for example.

[10] M.C. Roco, "From Vision to the Implementation of the U.S. National Nanotechnology Initiative," *Journal of Nanoparticle Research* Vol. 3, No. 1 (2001), pgs. 5-11.

[11] Associated Press, "EU chemical-safety plan is called unworkable," *Baltimore Sun* July 11, 2003.

[12] Samuel Loewenberg, "The Chemical Industry's European Reaction," *The National Journal* Vol. 35, No. 28 (July 12, 2003).

[13] David Barboza, "Monsanto Sues Dairy in Maine Over Label's Remarks on Hormones," *New York Times* July 12, 2003.

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