by Peter Montague

[Continuing: In Rachel's #798, I described the present system for regulating industrial innovation as the "prove harm" system -- anything goes until the public can prove to a scientific certainty that harm is occurring. And even when harm is obvious to nearly everyone (as in the case of toxic lead, PCBs, many pesticides, global warming, and so on), adequate regulations are vanishingly rare. Adequate regulatory control is almost never exercised because the people who make technical decisions for our society have a deep spiritual commitment to growth of Gross Domestic Product (GDP), which is defined as the market value of all goods and services. The means for achieving growth in GDP is rapid technical innovation, which is always labeled "progress" whether it provides any real benefits or not. Indeed, almost no one ever asks whether any real benefits are being produced by growth of GDP. If technical innovation merely churns the economy, that alone is sufficient justification for innovation because it provides opportunities for the wealthy to enhance their standing. If tens of millions of people get birth defects or brain damage or testicular cancer as a result of rapid technical innovation, that's just the price of progress, the argument goes, and it is all entered into the plus columns of our national GDP accounting system. Indeed, there is no negative column in the GDP accounting system -- auto wrecks, divorce, insanity, cancer and murder are all tallied as pluses in GDP accounts because they all churn the economy and create opportunities for profit among the owning class.]

It must be obvious that the "prove harm" regulatory system, first of all, requires large-scale harm to occur before anyone exercises restraint, and it places the burden of proof on the public to prove harm to a scientific certainty before government restrictions can be considered. As John Wargo pointed out in his book-length study of U.S. pesticide regulation, "The pursuit of certainty through science became a way of protecting the rights to use risky technologies and of securing or expanding trade."[1] And even after harm is widely documented, reform takes years, or decades. Meanwhile dangerous and unnecessary innovation continues and the fabric of life is shredded, ecosystem by ecosystem, species by species, death by death.[2]

It is now widely acknowledged that the "prove harm" system of regulation is causing widespread harm, even if we limit our examination to human health.[3] For example, a 1997 study (based on 1992 data) concluded that workplace chemical exposures kill an estimated 60,300 workers each year in the U.S. and sicken 860,000 more,[4] at a cost of $171 billion.[5] The authors of the study believe their estimates are actually somewhat low.[4] By this reckoning, the costs of job-related harms greatly exceed those of AIDS or Alzheimer's disease, and are comparable to the costs of the better-known major killers, heart disease and cancer.[5]

In addition, pesticides are taking a substantial toll on consumers, even by conservative estimates. In the mid-1980s, the National Academy of Sciences set out to study 53 popular pesticides that had been identified as known carcinogens. It turned out that the Academy could not find enough data about 25 (47%) of these potions to estimate the number of cancers they might be causing -- a startling admission -- so they narrowed their field of study to just 28 pesticides. They then calculated that the legal limits for these 28 would most likely allow 20,800 cancers each year in the U.S. If half those cancers were fatal, a reasonable estimate, it would mean 10,400 deaths each year or 28 funerals per day.[6]

Then, as now, the government was focused -- some would say obsessed -- with the cancer consequences of chemicals, allowing regulatory officials to pretty much ignore effects on the nervous system, the immune system, the reproductive system, the endocrine system, the metabolic system, and on the growth, development, intelligence and behavior of children. Even today, most of these non-cancer effects are still largely ignored by chemical regulators because the studies are too expensive, the details are overwhelmingly complex and, perhaps, the few findings to date are too disturbing. (In many cases, to acknowledge the existence of a problem today is to admit a serious public health failure in the recent past.[7]) In the last 20 years, independent scientists have revealed that non-cancer effects are far more widespread and medically significant than previously acknowledged.[3] For example, it is now widely recognized that many industrial poisons -- including many found in common household products such as drink containers, cosmetics, food packaging, and infants' and children's toys -- interfere with the hormones of living things.

Hormones are chemical messengers that act as biological signals, turning on and off bodily processes that guide growth and behavior. For example, hormones cause bears to hibernate, salmon to return to their birthplace to spawn, women to menstruate, and children's brains to develop. Hormones are present in blood at very low levels (parts per billion or even parts per trillion), and often only for short periods of time, yet they have very powerful, long-lasting effects on growth, development, metabolism, behavior and intelligence in living things.

In animals, the system of control by hormones is known as the "endocrine system." A recent report from U.S. Environmental Protection Agency (EPA) described the endocrine system this way: "An endocrine system is found in nearly all animals, including mammals, non-mammalian vertebrates (e.g., fish, amphibians, reptiles, and birds), and invertebrates (e.g., snails, lobsters, insects, and other species). The endocrine system consists of glands and the hormones they produce that guide the development, growth, reproduction, and behavior of human beings and animals.... Disruption of this complex system can occur in various ways. For example, some chemicals may mimic a natural hormone, 'fooling' the body into over-responding to the stimulus or
responding at inappropriate times. Other chemicals may block the effects of a hormone in parts of the body normally sensitive to it."[8]

All the governments of the industrialized world now acknowledge that some industrial chemicals can interfere with hormones and that growth-at-any-cost chemical innovation is harming human health. For example, the 30-nation Organization for Cooperation and Development (OECD) recently published a lengthy report called Environmental Outlook, projecting current environmental trends 20 years into the future.[9] Here is what the OECD says about the products of the chemical industry:

OECD countries presently create 220 pounds of legally-hazardous waste per person per year. By 2020, per-capita production will rise 47% to 320 pounds per person per year and, because of growing population, total OECD hazardous waste will increase 60% to 194 million tons each year.(pgs. 137, 314) All of this will eventually enter the general environment and significant portions of it will enter food chains.

A partial survey of 13 out of 30 OECD countries identified 475,000 sites that may be contaminated by hazardous industrial chemicals. The OECD estimates the cost of cleaning up these sites at $330 billion, a large number indeed. (pg. 242)

The OECD says there are somewhere between one and two million chemical preparations on the market today, each a mixture of two or more individual chemicals that do not react with each other. Each of these preparations must be considered in light of workplace hazards, accidents involving hazardous materials and harmful exposures of workers in other industries, consumers, the general public, and the natural environment, says the OECD. Unfortunately, there is "an immense knowledge gap about chemicals on the market," the OECD says: governments "lack adequate safety information about the great majority of chemicals." (pg. 223) The "unknown hazard" from chemicals is a "major concern," says the OECD. (pg. 226)

The OECD said, "Major concerns exist about the possible impact on the environment and human health of substances produced by the chemicals industry, which are found in virtually every man-made product," says the OECD. "Many are being detected in the environment, where particular problems can be caused by persistent, bioaccumulative and toxic chemicals. Concern is growing, for example, about chemicals which cause endocrine disruption and which persist in the environment," OECD says. (pg. 223)

"The loss of health due to environmental degradation is substantial" in OECD countries. (pg. 253) The "most urgent issues" are "air pollution and exposure to chemicals," the OECD says. The "greatest cause for concern" is the "threat of continuing widespread release of chemicals to the environment." (pg. 252) "This is not only a question of the amount of chemicals that end up in the environment, but more a question of their characteristics and effects. Unfortunately, the latter are often unknown, as the recent discovery of the endocrine disrupting effects of certain pesticide ingredients has shown," the OECD says. (pg. 252)

In sum, says the OECD, persistent toxic chemicals "are expected to continue being widespread in the environment over the next 20 years, causing serious effects on human health." (pg. 19)

So governments freely acknowledge that the current system of environmental regulation is causing substantial damage to human health (ignoring, for the moment, the devastation of non-human species).

The "prove harm" regulatory system rests on three assumptions:

1) Assumption No. 1: humans can "manage" the environment by deciding how much of any material the Earth (or any portion of the Earth) can safely absorb without harm. Scientists call this the "assimilative capacity" approach. According to this approach, scientists can reliably determine how much of any material the Earth, or any portion of the Earth (such as the Rio Grande River, or bald eagles, or a human population), can assimilate or absorb without serious harm.

2) Assumption No. 2: Once the Earth's "assimilative capacity" for a particular chemical (or other kind of damage) has been determined, then we can -- and will -- see to it that no greater amount of damage is permitted. We will set limits, river by river, factory by factory, chemical by chemical, everywhere on the planet, so that the total, cumulative releases do not exceed the "assimilative capacity" of the Earth (or any portion of the Earth).

3) Assumption No. 3: We already know which substances and activities are harmful and which are not; or, in the case of substances or activities that we never suspected are harmful, we will be warned of their possible dangers by traumatic but sub-lethal shocks that alert us to the danger before it is too late.[10]

Obviously the system really hinges on Assumption No. 1 -- that we can determine the 'assimilative capacity' of an ecosystem, or of a population of birds or polar bears or humans. For this purpose, a special technique has been developed called "risk assessment."

Risk assessment was adopted by the U.S. Environmental Protection Agency (EPA) in the 1970s because civil servants wanted government decisions to be more scientific and less arbitrary.[11] They were looking for ways to ground their decisions in a rational and reproducible process -- certainly a worthy goal. In the case of chemicals, risk assessment evolved into a technique that has three basic parts: (a) estimate the inherent hazard of the chemical (potency and dose-response curve); (b) estimate how many people will be exposed and at what levels; and finally (c) estimate the numerical probability of various harms occurring among those exposed.[12] For example, a risk assessment tells the federal Centers for Disease Control (CDC) that the damage caused by 10 micrograms of the toxic metal lead in a tenth of a liter of a child's blood is acceptable.[13] And therefore 11 micrograms or more is excessive. All seemingly precise and rational and scientific. Unfortunately, it isn't that way at all, as we'll see.

[To be continued.]


