CHEMICAL ROULETTE

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BY TIM SILLS

"I tell you what -- the most ways to get hurt is the most 'cause a feller gets to lookin' out only where he already seen bad news!"

--OLDTIME OREGON LOGGER

Everyday, travelers driving the Sunset Highway between Portland and the coast pull off close by mile post 30 and refresh themselves at a rock fountain of cold spring water.

The absence of chlorine's flat aftertaste and the lush backdrop of mountain forest make this stop a welcome habit for both tourist and commuter. Rarely, if ever, do any of these people hike north into the high ridgelines that feed the sweet spout.

If they did they'd see several clearcuts in different stages of regrowth. They might also notice the unusually lean show of broadleaf plants, like alder, vine maple and salal -- foliage that typically overruns west Oregon's logged-off slopes. But if such a hiker was, say, a toxicologist, then he'd likely recognize the calling card of herbicides -- chemical plant-killers used throughout the Northwest to knock out greenery that competes with the region's main money crop, fir. And if this well-read stroller just happened to work on the cutting edge of cancer research, he'd immediately shove his finger down his throat to vomit the water he'd mistakenly enjoyed at the seductive fountain below.

Along with a handful of other scientists in this country, he'd know herbicides are part of the first -- and only -- batch of allegedly "safe" chemicals recently shown to promote cancer in a way that caught the experts off guard. What he might not know, however, is that the dangerously-douched forest around him belongs to the State of Oregon; that they regularly spray their real estate with lethal chemicals; and though informed of the new and compelling cancer connection, this state hides its industry-before-life policy behind the convenient and granite bureaucracy of the Environmental Protection Agency.

For a half-century, it's been known that certain chemicals kick off a nightmare of cell mutation called cancer. The unquestioned mechanism of that horror, gene damage, is understood enough for the EPA to require testing of every registered chemical's effect on genes, that is, "geno-toxicity." Then the really bad stuff gets regulated, restricted or removed. And finally the incidence of cancer begins to drop, right?

Wrong. More people are getting cancer and nobody is really sure why, but many researchers have long suspected some form of environmental contamination that is both pervasive and subtle -- too subtle for 'smoking gun' detection.

The most unnerving development of this theory began taking shape during the past decade, and proposes that chemicals used routinely in our society may prompt cancer in a much less measurable fashion than rewiring genes -- by invading the immune system. A growing body of evidence suggests this is, in fact, the case.

By 1981, it was apparent that two unrelated branches of medical practice -- organ transplants and AIDS care -- had unusually high incidents of cancer among patients.

The only condition shared by these two groups was compromised immune systems (transplant patients have their immune systems chemically suppressed to minimize organ rejection). Subsequent efforts to map out the human immune system revealed a labyrinth of biological complexity so sensitive that critical response is determined at the molecular level.

In other words, the immune system is influenced by a lot more than the classic trespassers, 'antigens' like bacteria, virus, fungi, and foreign tissue. It also responds, *or succumbs*, to the swarm of manmade molecules that assault it constantly. And it is clear that some of these molecules are giving the worst possible messages to the immune system.

Life and death decisions are called by sub-microscopic nuances that will take years to decipher. The enormity of the project can be gauged by the fact that hope for an AIDS antidote is being pushed further and further into the next century.

While the immune-cancer probe is no less cryptic, two certainties are established: People with immune system problems are more likely to get cancer than people with healthy immune systems; and synthetic chemicals that *don't* bother genes can both cripple the immune system and trigger the development of cancer. But *which* chemicals? Those that are toxic by design, such as herbicides, were a logical place to begin looking.

At the National Cancer Institute (NCI) in Maryland, two scientists studying a gene-neutral, immune-exploiting herbicide -- 2,4-Dichlorophenoxyacetic acid (2,4-D) -- found evidence of a deadly correlation.

The NCI team, Dr. Shelia Hoar Zahm and Dr. Aaron Blair, demonstrated that groups occupationally exposed to this chemical had high incidents of Non-Hodgkins lymphoma, cancer of the lymphs.

The suspect chemical doesn't initiate cancer, but instead "liberates" a cancerous cell to reproduce unchecked. It manages this by interfering with an unbelievably intricate interaction of immune system cells and cell products: T- and B-cells, cytotoxic response, antibody formulation, thymic capacity, intercellular communication, suppression/enhancement balance and a host of other functions yet uncharted.

A chemically disrupted immune system risks not recognizing "non-self" intruders; the fine-tuned receptor molecules on lymphocyte surfaces are easily confused by "xenobiotics" like 2,4-D. The most tragic consequence of this tampering is a green light for cancer-initiated cells to breed malignant tumors.

In April '93, Zahm and Blair presented their findings to an EPA panel in Arlington, Virginia. At that time, at least 50-million pounds of 2,4-D and chemically related compounds soaked the U.S. annually.

"Exposure to phenoxy herbicides is widespread in the agricultural and general populations," the NCI report concluded. "The use has increased dramatically preceding and during the time period in which the incidence of Non-Hodgkins Lymphoma has increased..."

In spite of its squeaky-clean image, Oregon has been anything but shy about employing the unmatched efficiency of chemical weedeaters like 2,4-D on yards, roadsides, golf courses, farmland and replanted forests; from pasturage in the high desert to the money-green hills above the Sunset Highway.

The real snag in dealing with the immuno-toxicity revelation is figuring out how to handle the possible economic upheaval such information could dictate against industry. Think about it; only a few of the more obviously potent chemicals -- like 2,4-D -- have been scrutinized.

At this point, nobody knows for sure whether the most mundane species -- boring household products -- may adversely affect the immune system, either by slowly weakening it or by 'staging' it for carcinogenic attack.

None of these six-syllabled mysteries in your deodorant, detergent, car wax, soft drinks and the other ten thousand chemical props demanded by our stay-press culture have been studied for immuno-toxicity risks. What would the ramifications be if just one of them was exposed as a major player in, say, the current breast cancer epidemic?

On top of all this, the government watchdog commissioned to sort out this kind of mess -- the EPA -- appears too intimidated by the magnitude of the task to address it. That agency has kept track of the immune-cancer issue since the first scientific abstract on the subject appeared in 1981, and while advised on numerous occasions by outside researchers of the urgency for immuno-toxicity test requirements, it has yet to implement any standards for industry. "The growing awareness of the various possible mechanisms of pesticide carcinogenesis raises questions about the adequacy of the current regulatory safety testing requirements that focus on geno-toxic effects," warned the NCI report of Blair and Zahm.

Moreover, when immuno-toxicity requirements do appear, EPA intends to aim them only at chemicals *yet* to be registered. Meanwhile, the present reality of climbing cancer diagnoses literally screams out for the identification of *existing* environmental hazards.