

BY RUSSELL CLEMINGS

CANCER ON TAP?

The case against chlorine

Few industrial chemicals are as pervasive as chlorine. It's used in producing 85 percent of all prescription drugs, 96 percent of all pesticides and thousands of other products—ranging from the vinyl on your chair to the disinfectant in your tap water.

But now there is growing evidence that chlorine-based chemicals may be damaging our health, primarily by mimicking the sex hormone estrogen. Organizations from the American Public Health Association to Greenpeace have called for partial or total chlorine bans. In February, the Environmental Protection Agency asked Congress to create a commission to study the issue.

The \$70 billion-per-year chlorine chemical industry has begun an aggressive lobbying campaign to head off any further restrictions on the chemical, which is derived mainly from saltwater. "It's ludicrous to think you could ban a product that is part of nature and has so many uses," says a spokesperson for the Chlorine Chemistry Council.

Researchers began piecing together evidence on chlorine's hazards almost three years ago at a conference called by the World Wildlife Fund. There, scientists concluded that cancer, infertility and animal reproductive

abnormalities shared a common trait: All could be caused by synthetic chemicals—most of them chlorine-based—whose structures resemble human estrogens.

Estrogens are some of the most potent natural body chemicals. Even before birth, they guide development of male and female sex organs. They manage the female reproductive cycle from puberty to menopause. But estrogens have a dark side. High estrogen levels are considered a risk factor for breast cancer and other diseases. In men, excess estrogen can cause the shrinking of sex organs and enlargement of breasts.

Researchers believe that estrogen mimics create havoc by latching onto estrogen receptors on cells, either blocking the effects of natural estrogens or, in some cases, amplifying them. To date, the most damning evidence is from wildlife. In Florida, alligators exposed to estrogenic breakdown products of DDT, a pesticide once used widely, are giving birth to far more females than males, and males have sex organs much smaller than normal. In the Great Lakes, where fish accumulate estrogenic chemicals known as PCBs, so many salmon are sterile that the species is having trouble reproducing.

The evidence is less conclusive in humans. But sci-

entists believe estrogenic chemicals in the environment may help explain several alarming health trends. Since the 1930s, for example, average sperm counts worldwide have dropped by half. Testicular cancer has risen 50 percent in the last 20 years. Breast cancer rates among American women have doubled since 1960.

"The studies aren't definitive, but they've certainly raised a lot of questions and concerns," says Pamela Fernandez, health protection analyst for the American Public Health Association. At the association's annual meeting last fall, delegates asked industry to phase out use of chlorine chemicals unless it could prove they were harmless, or there were no lower-risk substitutes. Similar actions have been taken by two water-pollution scientific panels—the International Joint Commission, which is the environmental watchdog for the Great Lakes, and the Paris Commission, which monitors the Northeast Atlantic Ocean.

Though groups like Greenpeace have long advocated banning chlorine, the EPA proposal for a study of the chemical's hazards seems

to have caught industry off guard. For now it is up to Congress either to embrace the EPA proposal—or to decide that chlorine's economic importance outweighs its possible health risks.

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