

Ozone loss increases cancer risk, report finds

In a just-released report, given a qualified approval by the chemical industry, a National Research Council panel reaffirms the theory of ozone reduction resulting from emissions of chlorofluorocarbons (CFCs) and oxides of nitrogen, lowers the estimate of such a reduction by a factor of two to three, and confirms the relationship between exposure to ultraviolet light and the occurrence of nonmelanoma cancers.

The report, entitled "Causes & Effects of Stratospheric Ozone Reduction: An Update," offers no startling predictions. In fact, it relies heavily on an earlier World Meteorological Organization/National Aeronautics & Space Administration study for its estimate of ozone reduction. It does, however, offer some tantalizing biological findings that could help unravel the mystery of light-induced cancers.

As the WMO/NASA report predicts and the NRC panel reaffirms, current refined models predict a 5 to 9% steady-state depletion in total global ozone over the next 100 years if two CFCs— CF_2Cl_2 and CFCI_3 —continue to be produced at rates prevalent in 1977. In 1979, NRC had predicted a depletion of 15 to 18%. The newer, lower estimates result from improved laboratory measurements of the rates of reactions of hydroxyl radical. The panel was unable to assess how increasing atmospheric concentrations of oxides of nitrogen will affect ozone reduction. It does say, however, that "the effects of perturbations by CFCs and N_2O are not additive."

Although the panel regards the match between theory and observation as "consistent," it nevertheless notes "uncertainties" and "insufficiencies." More research is expected to resolve the discrepancies between theory and observation, the panel notes.

Such imperfections in the models aside, Richard B. Setlow, senior biophysicist at Brookhaven National Laboratory and chairman of the panel's Committee on Biological Effects, says that it is "absolutely certain that ozone depletion leads to increases in [short-wavelength] UV light hitting the Earth, which in turn results in increases in skin cancers. The data are very convincing."

The panel estimates that for every 1% decrease in stratospheric ozone there will be a corresponding 2 to

5% increase in basal cell skin cancer, and a 4 to 10% increase in squamous cell skin cancer in light-skinned races because of increased short-wavelength UV light (UV-B) striking Earth. Both are nonmelanoma cancers.

The relationship between sunlight and malignant melanoma is more confusing. "There are few data implicating UV-B [290 nm to 320 nm] as the only responsible wavelength region," and there are patterns in families that must be accounted for, the panel notes. Problems with sorting out the various threads of the melanoma puzzle arise from a lack of animal models or other means of determining UV-B's role.

Unlike an earlier Environmental Protection Agency report to Congress on regulations to protect stratospheric ozone, the NRC panel does not dismiss the mortality rate from nonmelanoma cancers. Although that rate is very low, the incidence of nonmelanoma cancer is very high. Nonmelanomas usually are not fatal cancers, but the total number of deaths from them may be comparable to that from the usually lethal melanoma, the panel says.

New data in mice and corroborating data in humans irradiated for various medical disorders offer tantalizing leads toward a better understanding of photocarcinogenesis. The immune system cleanses the body of potentially toxic or lethal agents, including cancer cells. UV-B, however, "inhibits the destructive ability of the immune system," Setlow says. That is, UV-B exposure induces changes in the immune system that suppress its ability to overcome the challenge of cancer cells. Mice challenged with tumors don't die of cancer; mice challenged with tumors and exposed to UV-B do. UV-B disrupts their immune response system and they don't reject the tumors.

EPA, which asked NRC to study the matter, will include the report in its decision-making process, along with the WMO/NASA report and 2000 comments received from its October 1988 Advance Notice of Proposed Rulemaking. The likelihood of the NRC report catalyzing EPA action toward stricter CFC regulation is remote, however.

Industry reaction to the report is cautious support. Joseph M. Steed, Du Pont chemist and chairman of the Chemical Manufacturers Association's fluorocarbon program, calls the report balanced—"a reasonable though not sufficiently complete" summary of stratospheric science. □

Synfuels Corp. under fire from Congress

The progress of the synthetic fuels industry in the United States took a step forward last month, but at the same time may have slid several steps backwards. Some synfuels projects are having problems and Congress is starting to throw darts at the agency set up to promote synthetic fuels development—the U.S. Synthetic Fuels Corp.

The Synfuels Corp. board of directors has narrowed from 11 to five the field of projects that it will consider for price supports and loan guarantees. The five projects all are considered sufficiently developed and financially mature to make a go at successful operation if they ever get to the point of producing fuel. The final selection of projects to be supported will be sometime this summer.

Coal projects dominate final selections of Synfuels Corp.

Catsys. Sponsored by California Synfuels Research Corp., this project will be sited in West Pittsburg, Calif. Using heavy oil as a resource, it is slated to produce 5100 barrels per day of fuel.

Breckinridge. Coal liquefaction project sponsored by Ashland Synthetic Fuels and Bechtel Petroleum. The project will be located in Breckinridge County in Kentucky and is targeted to produce the equivalent of 49,800 bbl of oil per day.

Peat Catery. Sponsored by the Peat Methanol Association, this project will use locally available peat to make the equivalent of 1900 bbl of oil per day in liquids in Creswell, N.C.

MLGW. Memphis Light, Gas & Water has been working for years to get its coal gasification plant built. The unit is expected to generate the equivalent of 8400 bbl of oil per day for the city of Memphis.

Hampshire. Joint venture sponsored by Koppers Co., Kaneb Services, Northeastern Mutual Life Insurance Co., and Standard Oil (Ohio). The coal project, located in Gillette, Wyo., will produce more than 19,000 bbl per day of gasoline, 914 bbl per day of liquefied petroleum gas, and another 1618 bbl per day of mixed butanes.

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A proxy fight for Gulf Resources

After hectic weeks of wooing stockholders and sparring with each other, the opponents in the battle for control of Gulf Resources & Chemical gathered anticlimactically for a mere 20 minutes in Houston last week to formally close out their proxy contest. "You mean I came all the way here for this," exclaimed one disappointed shareholder, who thought he would be witnessing an action-packed annual meeting. He and other shareholders will have to wait to find out who won until later this week when the results of the voting are announced at a rescheduled annual meeting.

The outcome could determine whether the company—a small sulfur operation just two decades ago—will continue as a broad-based natural resources concern. Over the past year, Gulf Resources has had to contend with numerous difficulties, including several takeover threats and proxy fights. These contests have helped focus attention on the company's underlying business weaknesses, which are accentuated by recessionary downturns in the housing and automotive industries (CW, June 17, 1981, p. 42).

Prices dropped. The most conspicuous example of the business problems that have harassed Gulf Resources is the costly writeoff for the shutdown of its Bunker Hill metals subsidiary. The unit, which produced lead, zinc and silver, had been the cause of nettlesome environmental expenses over the years. But what sealed its fate was the dramatic drop in metals prices over the past few years. The decision to close the unit led the company to a loss last year of \$78 million instead of an operating profit of nearly \$13 million.

Despite the memory of Bunker Hill, Gulf Resources' Chairman Robert H. Allen proclaims bright long-term prospects for most of the company's other businesses. These include coal, lithium, industrial explosives, fertilizer and salt, oil and gas, specialty clays, and engineering services.

Parties seeking to displace Allen and his colleagues challenge their ability to

get the best deal for shareholders, claiming that the current management has missed opportunities to redeploy assets in the past. "They have had the opportunity to do so for the past five years and have not. Why should we expect them to do so now?" asks the principal behind the attempt, British financier Alan E. Clore. In a short time, Clore has amassed more than a 15% stake in Gulf Resources stock.

Both Clore and Gulf Resources waged a fierce proxy battle replete with full-page newspaper advertisements over the past two weeks, but neither side could claim victory coming into the shareholder

meeting. Clore outlined several points of contention in his ads—among them that 21 of the company's officers and employees have entered into severance agreements that would provide them with approximately \$9.4 million in benefits should they be removed from office due to a change in management.

Options open. Clore himself has kept a low profile, however, and was represented in Houston last week by New York attorney

Kenneth J. Bialkin. Clore has not said much publicly about his intentions, other than to promise outside experts that he'll review various options if his slate of directors wins control. But there is considerable conjecture about what is on his mind. "He thinks he can make more through liquidation than the current management can make keeping the company in tact," comments one analyst.

Meanwhile, the top brass at Gulf Resources has not been sitting still. Management has tried to draw attention to Clore's alien citizenship, the fact that much of his holdings were purchased very recently, and the implication—lodged in a message to stockholders—that Clore's business record "gives no evidence whatsoever of experience or expertise in running a company or business."

The squabble has led the parties into litigation and brought politicians into the fray. For example, some congressmen have maintained that the deal should be blocked because lithium—Gulf

Resources claims half the production of the Western World—can be used in the manufacture of atomic weapons.

While the proxy fight still seems up in the air, some observers already are betting that Allen's crew will receive enough votes to retain control. They point, for instance, to one 11.6% block of votes reportedly cast in favor of current management. Ironically, the block is owned by Placid Oil, a company that in the past has expressed a desire to take over Gulf Resources. □

Rohm and Haas fights for its propanil rights

Rohm and Haas is trying to weed out competitors in the U.S. propanil market. The company says its patent 3,816,092 gives it a domestic monopoly on the chemical herbicide—and it's willing to take any challengers to court. In fact, Rohm and Haas has just filed its third lawsuit since 1974 to stop other firms from selling propanil to rice farmers in the Texas Gulf Coast and elsewhere in the U.S.

In 1974, Rohm and Haas sued Crystal Chemical and several other Houston, Tex., companies for refusing to drop out of the U.S. propanil business. The suit reached a Houston appeals court last fall, and a decision is pending. Meanwhile, in September, Crystal declared bankruptcy and sold its propanil operation to Cumberland Chemical, a new corporation. Rohm and Haas's latest suit, also filed in Houston, names as defendants Cumberland, its four shareholders, and its propanil distributors. Rohm and Haas recently prevailed in a similar case tried in New Orleans.

Process patent. But these patent-infringement suits are not the garden variety. The propanil molecule itself—3,4-dichloropropionanilide—has been declared unpatentable. Rohm and Haas instead holds a process patent on propanil's only known use—controlling barnyard grass and other weeds in rice and wheat crops. The company's Stam- and Stampede-brand propanil reportedly represents 80% of the \$35-million/year U.S. propanil market.

Joe C. Eller, former president of two companies named in the 1974 suit and a Cumberland shareholder, admits manufacturing Americe-brand propanil for sale to U.S. rice farmers. But he denies infringing Rohm and Haas's patent. "That patent covers the use of propanil on young, succulent weeds and grass in an established crop," says Eller. "Rice is



Kenneth Bialkin: the attorney for dissident shareholders.

Don Connolly

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not established when propanil is applied." George W.F. Simmons, chief patent officer for Rohm and Haas, says the company amended its patent to include propanil's use as a rice herbicide when that application was discovered.

Ned L. Conley, the defendants' attorney in both of the Houston lawsuits, says he intends to show that Rohm and Haas's patent was "obtained fraudulently." But Conley already has failed to prove that Rohm and Haas committed patent misuse when it refused to license the propanil process to his clients. In 1980, the U.S. Supreme Court settled that side issue in Rohm



Simmons is wary.

and Haas's favor. Jack C. Goldstein, chairman of the American Bar Assn.'s patent section, says the 5-to-4 Supreme Court ruling was a "landmark" for companies engaged in research. Goldstein explains that the high court had never before granted a monopoly on an unpatentable product.

Propanil, which competes with BASF Wyandotte's Basagran and Rhone-Poulenc's Ronstar, is the leading post-emergent rice herbicide in the U.S. Propanil is sold extensively in the South, but its use on rice crops in California has been restricted, because it has been found to damage adjacent prune orchards.

Yet another patent fight. Rohm and Haas hopes to gain a still-bigger share of the rice market by registering its highly successful Blazer herbicide for use on that crop. But Blazer's prospects may ultimately be blunted by another patent fight—this one between Rohm and Haas and Rhone-Poulenc—over who owns the diphenyl-ether technology used by both companies in making the broad-leaf herbicide.

Rohm and Haas's Stam-M-4 propanil retails for about \$16.50/gal in the Texas rice belt. Fred W. Belledin, the company's Southwest district manager for agricultural chemicals, said in an affidavit filed May 5 that Cumberland's propanil is underselling Stam by \$1-2/gal in Texas and Louisiana.

Belledin says this differential could cost Rohm and Haas 50% of the Stam market in 1982. Cumberland's Eller says that if he and his co-defendants are pushed out of the propanil market, Rohm and Haas will raise the price to \$21/gal to earn an additional \$300 million over the next 10 years. Says Eller: "Rohm and Haas has more to lose in this lawsuit than we do." □

A judicial warning for DES makers

Since the Food and Drug Administration banned the use of diethylstilbestrol (DES) in 1971, pharmaceutical houses have been flooded with liability suits. DES had been used since 1947 to prevent miscarriages in pregnant women, but reports of vaginal cancer and other problems in the children of those women led to the ban. So far, just a few of the lawsuits have been decided against the multitude of pharmaceutical firms that sold DES, because few plaintiffs could document which brand of the drug they took. But last week, New York State's highest court ruled for a plaintiff, even though she didn't know the manufacturer of the DES her mother took.

New York's Court of Appeals ruled that Eli Lilly must pay \$500,000 in damages to Joyce Bichler, who developed cervical and vaginal cancer in 1971 at age 17. Bichler says her mother took DES during pregnancy. In this first DES award to withstand appeal, the seven-judge panel found the firm liable because it marketed the hormone without first testing it on pregnant mice. Lilly maintained that its DES was subjected to rigorous clinical tests.

Lawyers for Bichler did not try to prove that her mother had taken DES made by Lilly because available medical records do not indicate the brand prescribed. Instead, they based their case on the theory of concerted action, under which all parties to "parallel" actions are responsible for any of the consequences.

Race to market. "Lilly's failure to test DES on pregnant mice before marketing substantially encouraged other DES manufacturers to do the same," the appeals court decided. Proving that DES makers had expressly agreed on the matter is not necessary, the judges ruled, because "consciously parallel conduct by itself is enough." Under concert-of-action law, Lilly now has the right to recover part of this award from other DES manufacturers. Lilly says it is weighing its options.

The ruling against Lilly is expected to strengthen other cases where the specific manufacturer cannot be identified. In one such case, the California Supreme Court ruled that Judith Sindell could sue those manufacturers who held the biggest share of the DES market and receive damages from the various DES makers based on the size of that share.

Whether other states will recognize market-share liability remains to be

seen. But the Lilly ruling does create a precedent for concert-of-action cases, which are easier to press because the defendant need name only one among the many DES makers. "It's very significant," says John Zackey of the Association of Trial Lawyers of America, who says there are more than 1,000 DES cases now pending. "Concert of action is a well-established theory of law—what's new is its application to DES."

The potential liability for the pharmaceutical firms that sold DES is huge. In the biggest DES award so far, a Philadelphia district court ordered E.R. Squibb & Co. on Mar. 24 to pay defendant Judith Axler \$2.2 million because she claimed she had developed vaginal cancer as a result of her mother's use of the drug. Lawyers were able to marshal evidence that Axler's mother had used DES made by Squibb. □

New sweeteners ogle saccharin's markets

For years, the labeling on diet sodas and other low-calorie foods that contain saccharin has clearly stated that the product may be "hazardous to your health." Undaunted, weight-conscious Americans blithely continue to consume the artificial sweetener. But saccharin has now been added to the Health and Human Services Dept.'s list of suspected carcinogens, giving an extra push to the development of saccharin alternatives.

Last week, Biospherics (Rockville, Md.) obtained an exclusive license to use a process developed by Boise Cascade (Boise, Ida.) for making "left-handed" sugar, an isomer of natural sugar that reportedly is nonfattening. Biospherics, a research, engineering and information-services firm, hopes to market the chemical under the trade name Lev-O-Cal if development is successful and the company receives Food and Drug Administration approval.

Similarly, scientists from the University of Dayton say they've discovered a process for developing "polymerized sugar," a linkup of sugar with polyvinyl alcohol. The compound causes neither cavities nor weight gain, they say.

Acceptance growing. There appear to be no nonsaccharin substances that have greater short-term potential, however, than aspartame, G.D. Searle's low-calorie sweetener. In the last few weeks, both General Foods and Borden's Wyler Unit began test marketing new sugar-free powdered drink mixes that contain Searle's aspartame-based NutraSweet.