

ENVIRONMENT

Illegal aliens thrive in polluted water

"We normally consider the introduction of an exotic [non-American] fish as the introduction of a biological pollutant," says Paul Shafland, head of the world's oldest laboratory devoted to the study of non-native fish (SN: 6/21/80, p. 398). So perhaps it's only fitting that one of the most infamous of the "pollutant" fish introduced to American waters is being proposed to stock ponds of polluted wastewater from coal-fired power plants.

"Tilapia thrives well in irrigation-quality water," says Rex In-fanger, a Brigham Young University researcher, "because they've adapted . . . in their native Africa to low oxygen conditions and water that is really high in total dissolved solids." The fish, which tastes like perch, loves the murky coal-wastes ponds, which may contain 3,500 parts per million (ppm) total dissolved solids. A typical trout stream, by contrast, has fewer than 400 ppm and some mountain creeks have only 65 ppm dissolved solids.

Trafficking cancers

A Seattle study finds that for women living along streets with at least 15,000 vehicles passing by each day, the risk of developing lung cancer is double that of women on streets with less than 15,000 passing vehicles. No similar cancer elevation was noted in men. The study controlled for age, socioeconomic indices and geographic district but not for smoking habits or other factors with which lung cancer has been linked.

Due to the size of the study population, the results were not clearly of statistical significance. "So it's inconclusive, but tantalizing," says Lincoln Polissar. He directed the work at the Fred Hutchinson Cancer Research Center in Seattle.

The study's intent was to test the hypothesis that persons exposed to high levels of automobile exhaust face higher cancer risks. A 12-year study by Max Blumer and colleagues (SN: 11/5/77, p. 296) focusing on cancer mortality in a small Swiss village showed a ninefold cancer increase for residents living along busy thoroughfares.

"Lung cancer was chosen as the malignancy with the greatest likelihood of correlation with exposure to automobile exhaust," write Polissar and Homer Warner in the June ENVIRONMENTAL SCIENCE AND TECHNOLOGY. "We expected the milder non-melanomic skin cancer to show little, if any, correlation."

Working on those assumptions, the duo tracked down cases of both diseases in the Seattle area via the local tumor registry. Three analyses were used to hunt correlations between daily traffic flow and a sampling of the lung-cancer patients (373 males and 291 females). The control group was an equal number of nonmelanomas.

The researchers note there are important differences between the Swiss and Seattle studies. Among them: "Blumer found an elevated risk for all types of cancer; we studied only lung cancer . . . Blumer's retrospective cohort study followed . . . people forward in time, while we imputed the level of past exposure from the traffic volume at the current address." Such differences could be used to argue that the studies are not comparable. "Nevertheless," the Seattle team claims, "we would have expected Blumer's high relative risk of 9.0 to have yielded a significant excess in our study." Polissar says his study does "suggest some effect, but not of the magnitude Blumer found."

Goats in space

A Cornell University computer simulation of regenerating life-support systems for long space missions suggests goats will fit in nicely. According to Michael Shuler, goats eat almost anything, produce a lot of milk and can digest biological wastes that will eventually be fed to aerobic bacterial digesters.

BIOMEDICINE

Novel therapy for high blood pressure

High blood pressure, a medical problem for one out of every five Americans, may eventually be treated in a highly creative way — with antibodies instead of synthetic chemicals. Such is the ambition of Edgar Haber, professor of medicine at Harvard Medical School, and scientists at DNAX, Ltd., a genetic engineering firm formed earlier this year in Palo Alto, Calif.

Haber and his colleagues are drawing on recent developments in immunology, genetic engineering and drug delivery in order to achieve their aim. Specifically, they have made antibodies that react against renin, a kidney enzyme that plays a major role in high blood pressure, and have shown that the antibodies can lower high blood pressure in animals. If the antibodies are found to do the same in humans, the investigators would, using recombinant DNA techniques, make large batches of select parts of the antibodies, then package the antibody fragments in a unique drug delivery system developed by Alza Corp. in Palo Alto (SN: 4/5/80, p. 212). The system would release the antibody in a patient's body over a period of many weeks.

Beta-endorphin in the placenta

The placenta, the organ of metabolic interchange between the fetus and its mother, is known to produce a few proteins similar in structure and function to some pituitary gland hormones. Now the placenta has also been found to synthesize a protein similar to, or actually identical with, the pituitary protein beta-endorphin. A. S. Liotta and R. Houghten of Mount Sinai School of Medicine in New York City reported in Cincinnati at the recent annual meeting of the Endocrine Society.

Beta-endorphin exerts psychological and behavioral effects rather than classic hormonal effects. For instance, it has been found to alleviate depression and seems to play some role in obesity. Although its function in the placenta is unknown, it might possibly help fight child-birth pain; endorphins have been found to be activated in the final stages of pregnancy and to raise maternal thresholds to pain (SN: 10/11/80, p. 233).

Organ transplants: Backward and forward

Although far more kidney transplants have been performed than other kinds of organ transplants (SN: 11/16/74, p. 314), not as many are being done today as used to be. Jhoong S. Cheigh of New York Hospital-Cornell University Medical Center and colleagues explored the cause of this decline in 140 kidney dialysis patients and 100 consecutive recipients of cadaver kidney transplants. As they report in the July 10 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, the cause is a growing number of kidney dialysis patients who are untransplantable because they possess antibodies against antigens in cadaver kidneys. The patients acquired those antibodies through previous kidney transplants and accompanying blood transfusions.

On a more positive note, the odds of surviving a liver transplant are increasing. Thomas E. Starzl of the University of Pittsburgh School of Medicine and co-workers gave 12 liver transplant patients a drug called cyclosporin A and the steroid hormone prednisone to suppress their immune systems' rejection of the transplanted livers. An average of one year after operation, 10 of the 12 patients (83 percent) are still alive, compared with a 32 percent survival when patients have gotten conventional immunosuppressive drugs. Starzl and his team report in the July 30 NEW ENGLAND JOURNAL OF MEDICINE. "The follow-up period in this small number of patients is still short," they say. "However, it is unlikely that the striking improvement in the early results after liver replacement could be a statistical accident."