

EXTRACTIONS



a newsletter from **O'CONNOR ASSOCIATES**

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PVC LUNG HELPS LAKE BREATHE AGAIN

Years of cottage development around Chesley Lake in Ontario have seen organic matter and sediment dumped at the bottom of the lake, depleting its oxygen supply, and impacting its aquatic life. This year the water is clearer, oxygen levels are up, and algal growth is down thanks to the work of the Friends of Chesley Lake, Ontario Ministry of Environment, and IPEX Inc., a PVC pipe manufacturer who donated pipe for this lake lung project. Together they have revived Chesley Lake by supplying pure oxygen to the cold bottom waters of the lake without disturbing the lake's stratification. During the summer the project generates oxygen on shore and distributes it to the lake through a PVC pipe system. The pipe has proved to be stable, too, having survived five years in the harsh freezing and thawing conditions of southern Ontario.

[from *Environmental Science & Engineering*, May, 1997]

MARINE ALGAE MAY PROTECT ORANGES FROM FREEZING

In a breakthrough study, Andrew Hanson, Horticultural Science Department, University of Florida, has traced the biochemical steps that marine algae use to make 3-dimethylsulphoniopropionate (DMSP). This DMSP helps protect the algae from freezing and high salinity. Genetic engineering could transfer this DMSP-making capability from algae to cold-sensitive crops such as citrus.

Hanson's work has other implications, too. First, some higher plants that tolerate freezing, high salinity, and drought also form DMSP. But they do it by a completely different biochemical route, indicating that DMSP biosynthesis must have evolved independently at least twice. Second, bacteria and algae degrade DMSP to dimethylsulphide (DMS) which contributes about 1.5×10^{13} grams of sulphur to the atmosphere annually. DMS plays a major role in the global sulphur cycle, in cloud formation, and potentially in global warming and cooling. Understanding how DMSP is produced will improve our understanding of global climate changes.

[from *Nature*, Vol. 387, June 26, 1997, p. 891]

WOMEN ARE JUST BORN WITH IT

Women are genetically programmed to pick up social skills at birth in the same way that we are all programmed to learn language. However, men are born without the "social cognition" gene and have to be deliberately taught social skills. This gene may partly explain why women have better social skills than men and why men are more prone to developmental disorders — such as autism — that affect language and social functioning.

Prof. David Skuse, Institute of Child Health in London, England, and Dr. Nina James, Wessex Regional Genetics Laboratory in Salisbury, have reported the first known case of imprinting in humans. Imprinting refers to the finding that the same gene can result in different expressed characteristics depending on whether it is inherited from the father or the mother. In this study, Dr. Skuse et al. have shown that social functioning is influenced by an imprinted gene on the X-chromosome which girls inherit from their fathers.

They compared women with Turner's syndrome (they have only one X-chromosome) whose X-chromosome came from their father with those whose X-chromosome came from their mother. Although some psychologists might dispute the testing instrument, those women whose X-chromosome came from their father showed much better social skills than those whose X-chromosome came from their mother.

Normal women have two X-chromosomes, inheriting one from each of their parents. Normal men have one Y-chromosome and one X-chromosome, which they always inherit from their mother. The "social cognition" gene on the X-chromosome from the mother is apparently switched off in both men and women, so the one from the father is the active one in women.

So, you mothers of daughters, look to your partner's mother for evidence of the gene that influences your daughter's social behaviour. But, of course, it's never that simple. Any one gene contributing to an aspect of behaviour will have only a small effect on the total population variation, which almost certainly involves many other genetic and environmental factors. Let the nurture-nature debate continue.

[from *Nature*, Vol. 387, June 12, 1997 p. 705]

WET CLEANING COULD REPLACE DRY

A water-based process labelled 'wet cleaning' can effectively replace toxic dry cleaning methods, according to a South Coast Air Quality Management District study. The year-long study in Los Angeles used non-toxic soap and water to clean 'dry clean only' garments, with a 99.9% success rate. The system is meant to replace dry cleaning which, despite advanced emissions controls, is responsible for the release of substantial amounts of the cancer-causing chemical, perchloroethylene, said AQMD officials. Perchloroethylene has been in use by dry cleaners since the 1950s, generating at least 144 tons of hazardous waste annually. The study also showed that wet cleaning actually removes stains more effectively than dry cleaning. However wet-washed garments take longer to iron after washing and the process cannot remove all stains. Of the 35,000 delicate garments washed in the study, only 33 were rejected due to concerns about color bleeding.

[from *EarthVision News Reports* 10/22/97,
<<http://www.gnet.org/news/summary/>>]

GLOW-IN-THE-DARK MICE

Medical researchers can now observe the effects of their research without killing and dissecting their experimental animals. Geneticist, Masaru Okabe and his team from Osaka University have injected mouse embryos with the DNA of a bio-luminescent North American jellyfish. The young mice glow a vibrant green when viewed under ultraviolet light and continue to glow into adulthood. "We have also developed the technology to make specific cells glow as markers," said team member Shuichi Yamada. Others felt that, despite the new technique, scientists would continue to kill and dissect their test animals to study the full effects of their experiments.

[from *Calgary Herald*, June 14, 1997].

OTTAWA GOLD

A group of prospectors are screening the bottom of the Ottawa River in hopes of salvaging the precious metal flushed down the sewer of the Royal Canadian Mint. The mint now has a waste rate of less than 1%, but at the beginning of the century it was 2% to 3%. Jim Ford and two other companies estimate they can salvage 1 million ounces of gold worth about \$420 million at current prices, using a giant crane mounted on a barge.

[from *EnviroLine*, August 11, 1997, Vol. 8, No. 15, p. 10]

TAKE AN ASPIRIN AND CALL ME IN THE MORNING

Russian cosmonauts aboard the space station Mir tried to clear a clogged pipe in an oxygen generator using an acidic solution made with aspirin.

On August 12, 1997, NASA reported:

Although other systems aboard the Mir remain in good working order today, the Elektron in Kvant-1 is still not operating. A second, older unit in the Kvant-2 module has been powered off since late June when electricity to Kvant-2 was curtailed because of the disconnection of solar array power cables from the damaged Spektr module. Ground controllers uplinked procedures to the crew to attempt to unclog a potential block in the Kvant-1 Elektron's hydrogen loop, which vents hydrogen overboard as a result of the electrolysis process that generates oxygen for the station. The cosmonauts plan to use a tube from a discarded cooling garment, place that tube into the hydrogen loop, and fill the loop with water and aspirin in an attempt to dissolve the clog, which may be alkaline particles, according to Russian technical experts. In the meantime, the temporary shutdown of Elektron poses no problem or threat to crew safety or mission goals. Oxygen generating canisters are being activated periodically to provide ample oxygen for the Mir.

The aspirin must have worked as the Mir cosmonauts have not reported any more problems with the generator.

[from Mir 23/NASA 5 Status Report #54 August 12, 1997,
<<http://www.maximov.com/Mir/mir23status54.html>>]

DISAPPEARING ACT

Calgary's Foothills Hospital is spending \$200,000 over six months to pilot test soluble surgical gowns. The new gowns are sewn from Orex, a biodegradable fabric made from polyvinyl alcohol, the same type of organic polymers used in gelcap coatings on pills. The fabric dissolves in hot water (203°F) in a special processor that agitates 125 pounds of material for 36 to 48 hours and drains it into the hospital's waste system. The resulting waste breaks down into carbon dioxide and water within a week.

The hospital currently incinerates any blood-soaked and potentially infectious laundry. This is only 4% of the hospital's laundry load, but it accounts for 80% of the handling and disposal costs.

[from *EnviroLine*, July 14, 1997, Vol. 8, No. 14, p. 8 and Isolyser Co. Inc. advertising]

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