JANET’S CORNER - NOT TOO SERIOUSLY!

Marketing Jargon Pt 2t

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The chemical compound trichloroethylene is a chlorinated hydrocarbon commonly used as an industrial solvent. It is a clear non-flammable liquid with a sweet smell. [1]

Its IUPAC name is trichloroethene. In industry, it is informally referred to by the abbreviations TCE, Trike and tri, and it is sold under a variety of trade names. In addition to its industrial uses, trichloroethylene was used from about 1930 as a volatile anaesthetic and analgesic in millions of patients, before its toxic properties were realized.

Pioneered by Imperial Chemical Industries in Britain, its development was hailed as a revolution: lacking the great hepatotoxic liability of chloroform and the unpleasant pungency and flammability of ether, it nonetheless had several pitfalls, including the sensitisation of the myocardium to epinephrine, potentially acting in an arrhythmogenic manner. Its low volatility demanded the employment of carefully regulated heat in its vaporization. Research demonstrating its transient elevation of serum hepatic enzymes raised concerns regarding its hepatotoxic potential. Several deaths occurred as a result, though the incidence was comparable to that of halothane hepatitis. Incompatibility with soda lime (the CO2 adsorbent utilized in closed-circuit, low-flow rebreathing systems) was also a concern. TCE was readily decomposed into 1,2-dichloroacetylene, a neurotoxic compound potentially responsible for its hepatotoxic potential, though its metabolite trichloroacetic acid is more probably the etiological source of the latter. Halothane usurped a great portion of its market in 1956, with its total abandonment not achieved until the 1980s, when its use as an analgesic in obstetrics was implicated in fatal death. Concerns of its carcinogenic potential were raised simultaneously.

Trichloroethylene has been widely used as a degreaser for metal parts. In the late 1950s, the demand for trichloroethylene as a degreaser began to decline in favour of the less toxic 1,1,1-trichloroethane. Another problem with trichloroethylene is that it’s just too good a solvent in many mechanical applications, as it easily will strip many paints almost instantly and dissolves some plastics. However, 1,1,1-trichloroethane production has been phased out in most of the world under the terms of the Montreal Protocol, and as a result trichloroethylene has experienced a resurgence in use. It has also been used for drying out the last bit of water for production of 100% ethanol.

Trichloroethylene (Trimar and Trilene) was used as a volatile gas anaesthetic from the 1930s through the 1960s in Europe and North America. Supplanting chloroform and ether for a significant period of time, trichloroethylene demonstrated superior efficacy in induction times and cost-effectiveness. It retained use in other locations well into the 1990s. It was known for its favourable analgesic properties. Induction of general anaesthesia was accomplished by administering up to 1%(v/v) vapour. Equilibration would often result in patient levels of 0.1 to 0.5% vapour. Many patients were given Trilene inhalers to self-administer analgesia, especially in obstetrical labour. The number of patients exposed to these high levels of trichloroethylene is difficult to know, but is certainly well into the millions. [1]

ENVIRONMENTAL IMPACT [2]

Avoid contaminating waterways. This product has low potential for bioaccumulation and is not readily biodegradable.

Harmful to aquatic animals. May cause long term adverse effects in the aquatic environment.
TOXICITY [2]
ORAL LD50 (rat): 4920 mg/kg
INHALATION (rat) LCLo: 8000 ppm/4hr
Irritation: Skin (rabbit): 500mg/24hr - severe irritant.
Eye (rabbit): 20mg/24hr - severe irritant.

Trichloroethylene has been associated with cancer in rodents. Studies in workers have failed to demonstrate a relationship between exposure to trichloroethylene and an increase in the evidence of cancer.

IRAC Classification: Group 2A agent - Probably carcinogenic to humans.
Hazard Category: Harmful

EXPOSURE STANDARDS [2]
TWA: 50 ppm (270mg/m3)
STEL: 200 ppm (1080mg/m3)

Personal Protective Equipment:
When engineering controls cannot reduce exposures enough, a respirator must be worn and a respiratory protection program must be developed, as described in detail in Cal/OSHA regulations (GISO 5144). An industrial hygienist or other trained person should be consulted to ensure that the equipment is appropriate and is used correctly. An organic vapor filter cartridge can effectively filter out TCE. However, many people cannot smell TCE even when they are exposed at levels above the PEL, so they cannot tell when the cartridge has worn out. Therefore, filter respirators are not approved; a supplied-air respirator must be provided. If frequent or prolonged skin contact with TCE cannot be avoided, or if splashing may occur, other protective equipment such as gloves, goggles, or faceshields should be worn. TCE quickly penetrates the material of most types of protective gloves and aprons; materials that may be a little more resistant include Teflon, Silvershield, chlorobutyl rubber, and possibly SBR/neoprene rubber. Even the most resistant materials can be penetrated very quickly, so protective clothing should be replaced often. If TCE penetrates gloves, it may be worse than working bare-handed, because the gloves keep the TCE from evaporating off of your skin. TCE usually contains trace amounts of stabilizers (much less than 1% by weight) to keep it from decomposing into toxic and corrosive acidic by-products. The stabilizers usually don’t change the toxicity of the product much, although certain ones may be a bit more carcinogenic than TCE itself.

Asia Pacific

Authority starts work on new 1080 management regime
2007-10-03

New Zealand’s Environmental Risk Management Authority (ERMA) has begun establishing the new management system for the pesticide 1080. In a reassessment released a month ago, the authority confirmed the value of the pesticide in the fight against possums, but indicated that significant improvements were required in using the poison. Tighter mandatory controls on users have now been implemented, including active monitoring of aerial operations by means of a watch list and better management practices. In addition, ERMA is pushing for further research to be done into alternative methods of possum control and certain impacts of 1080. The new regime will enter into force by 1 January 2008.

Authority chair Neil Walter says, “Users of 1080 will have to produce detailed reports for the authority on each aerial drop carried out after this date, including comments on any incidents and complaints received from the public. Furthermore, ERMA will be inviting the public to submit reports on any incidents or problems.” Mr Walter says the first step is to appoint someone to coordinate the new regime. “This involves tracking research being done on 1080, closely monitoring the aerial drops, overseeing the implementation of the authority’s recommendations on best practice procedures for managing 1080 operations and receiving and following up any complaints from the public.” He adds that although users of 1080 do not have to report on aerial operations until after 1 January there will still be plenty for the coordinator to do in the interim. “There is a lot of technical work to be done in setting up the watch list. Following up on the Authority’s best practice and research recommendations is also an important task for the 1080 coordinator.” Since ERMA released their decision on 1080, they have been publicising the new requirements and best practice recommendations to relevant industry groups such as the National Possum Control Association and test certifiers (experts who ensure that operators are qualified to handle a hazardous substance). The first annual report on 1080 aerial drops is due to be released by the middle of next year. This is likely to focus on the implementation of the authority’s recommendations on research rather than on aerial drops because aerial operations generally do not start until around August of each year.

Environmental Risk Management Authority, 13 September 2007
http://www.ermanz.govt.nz

Equine influenza vaccine
2007-10-03

On Thursday 20 September, the Australian Pesticide and Veterinary Medicine Authority (APVMA) issued six emergency permits for the supply and use of equine influenza (EI) vaccines manufactured overseas. The permits allow use of the EI vaccines only under the authority and control of the Chief Veterinary Officer in each state. The APVMA evaluated the safety and efficacy of the vaccines and sought advice from the Office of the Australian Chief Veterinary Officer, the Office of Gene Technology Regulator, Biosecurity Australia, the Department of Environment and Water Resources, the Australian Quarantine and Inspection Service (AQIS) and state departments of agriculture or primary industries. For further information on the use of EI vaccine, horse owners should contact their state agriculture or primary industries departments.

APVMA, 20 September 2007
http://www.apvma.gov.au
Korea Amends Industrial Safety and Health Act

2007-10-03

On July 2, 2007, the National Assembly in South Korea approved an amendment to the Industrial Safety and Health Act (ISHL). This amendment aims to improve the enforcement of chemical safety implementation in workplaces. The amendments will come into force effective from 1 January 2009. Under the current system, the country’s occupational exposure standards are based on recommendations, and in the event where concentrations of hazardous substances exceed the standards, the government can only issue a warning to the offending company. The current system has been criticised as being inefficient in protecting workers from exposure to harmful chemical substances as poisoning incidents are constantly reported to the Ministry. The amendments will replace the current advisory standards with “Hazardous Agents” Authorization Standards. The new system will require an employer to maintain the level of occupational exposure to hazardous agents, including carcinogenic and mutagenic substances, below the allowed limits. These standards will be strictly enforced and anyone violating them may result in a fine of up to 10 million won. These changes are an attempt by the Ministry to encourage employers and employees in their effort to reduce occupational diseases due to hazardous substances in Korea. According to the announcement by the Ministry, an amendment to the Industrial Safety and Health Act’s Enforcement Decree is expected by the end of this year and will specify hazardous substances and authorization standards for these substances. In addition, the Ministry is strengthening the work environment monitoring system and the qualification for workplace inspectors.

ChemAdvisory Newsletter, October 2007 Volume 40

http://www.chemadvisor.com

America

Methylene Chloride Standard under Review

2007-10-03

The United States Occupational Safety and Health Administration (OSHA) are currently reviewing the Methylene Chloride Standard under Section 610 of the Regulatory Flexibility Act and Section 5 of Executive Order 12866 on Regulatory Planning and Review. The aim of the review is to determine whether the current standards place any unnecessary burdens on small businesses as well as to identify ways to improve its effectiveness. Initially, the Methylene Chloride Standard was adopted in 1971 to protect workers in general industry, shipyards, and construction from injury to the neurological system and from irritation. In 1985, the National Toxicological Program (NTP) reported that the substance is a potential cancer-causing agent, triggering several unions to petition OSHA to reduce worker exposure. After a thorough review of human and animal data, OSHA determined that there is a significant risk of cancer from methylene chloride exposure and that the existing Permissible Exposure Limits (PELs) do not provide adequate protection for employee health. In 1997, the standards were revised. The rule sets a PEL of 25 ppm over an 8-hour Time-Weighted Average (TWA) and a Short-Term Exposure Limit (STEL) of 125 ppm for 15 minutes. The level at which regular monitoring is required, or action level, is 12.5 ppm calculated as an 8-hour TWA. The standard includes specific requirements depending on the nature of exposure and health status of employee. Employers are required to:

The aim of the review is to determine whether the current standards place any unnecessary burdens on small businesses...
• Provide information and training to employees
• Provide facilities for washing methylene chloride off of persons or clothing
• Establish procedures for determining employee exposure
• Notify employees of monitoring results
• Allow employees/designated representative to observe monitoring
• Establish medical surveillance programs for those exposed to methylene chloride
• Maintain records of exposure measurements and surveillance
• Provide temporary medical removal of an employee and protection of benefits during removal if a medical professional determines that exposure may aggravate or contribute to an existing skin, heart, liver, or neurological disease

Methylene chloride is a solvent, which is used predominantly in metal degreasing and aircraft paint removal. Furthermore, it is used in the manufacturing of adhesives, inks, ink solvents, film base, and some plastics. Overexposure of the chemical can cause respiratory or central nervous system failure and risk of cancer. Public comments on ways to modify the standard governing methylene chloride exposure are being accepted until October 9.

ChemAdvisory Newsletter, October 2007 Volume 40
http://www.chemadvisor.com

**EPA Proposes Amendments to Oil Spill Prevention, Control, and Countermeasure**
2007-10-03

On 1 October 2007, the U.S. Environmental Protection Agency announced that it is proposing revisions to certain regulatory requirements for facilities subject to the Spill Prevention, Control, and Countermeasure rule. The revisions will tailor and streamline requirements to particular industry sectors and facility owners or operators subject to the rule. There is nothing in the new proposal that would remove any regulatory requirement for owners or operators of facilities in operation before 16 August 2002 to develop, implement and maintain an SPCC plan in accordance with the SPCC regulations then in effect. These facilities are required to maintain their plans until the applicable date for revising and implementing plans under the new amendments. The EPA will accept public comments on the proposed changes for 60 days following publication in the Federal Register, which is expected within two weeks. Further information regarding the proposed rule can be found at: epa.gov/oilspill/spcc_oct07.htm

Environmental Protection Agency, 1 October 2007
http://www.epa.gov

**Review of OSHA's Lead Standard Finds it Effective**
2007-10-03

A review by OSHA of its Lead in Construction Standard indicates the standard has helped reduce blood lead levels among construction workers, thereby reducing the incidence of lead-related disease. The review has also identified that the standard has not had a negative economic impact on business, is not overly complex and does not conflict with other regulations. However, OSHA Administrator Edwin Foulke Jr. emphasized that those working in the construction industry are still being exposed to high levels of airborne lead. “Employers and employees in the construction industry stand to benefit from the results of this look back review,” Foulke said. “Certain construction jobs still experience high levels of airborne lead and the
retention of this Standard is necessary to ensure employees are protected from high lead exposure.” As a result, OSHA have now concluded that it is necessary to retain the standard but will consider improving outreach materials and increasing their dissemination. In addition, the agency will consult with the Department of Housing and Urban Development (HUD) and as well as with EPA about developing a unified training curriculum and further integrate initial assessment interpretations to reduce cost and simplify requirements for small businesses. The agency said that the aim of the Lead in the Construction Standard is to protect employees in the construction industry from lead-related health effects. OSHA estimates that in 2003, 649,000 employees were exposed to lead at levels that may trigger application of the standard. Between 1993 and 2003, federal OSHA and state-plan states conducted 4,834 inspections and issued 12,556 citations related to lead exposure, the agency said. Studies have shown that elevated blood lead levels can produce irreversible adverse health effects, such as neurological and kidney disease and negative cardiovascular effects in construction employees. Construction employees primarily are exposed to lead when they remove lead-based paint from structural steel bridges or buildings, engage in the removal of lead from buildings or prepare some old residential units for painting or remodelling these units. A relatively small number of construction employees are exposed to lead when using molten lead to seal cables, when working with lead-containing mortar and lead sheeting and when repairing old plumbing and performing work on older structures, as well as on shielding for ionising radiation, radioactive materials and X-rays, according to OSHA.

Occupational Hazards, 2 October 2007
http://www.occupationalhazards.com/news

Popcorn chemical bill halted in cliff-hanger
2007-10-03

While the proposed state legislation to ban the butter-flavoured chemical used in microwavable popcorn certainly seemed to have the necessary votes to pass out of the state Senate, a move by a Republican senator left the majority Democrats outflanked and the legislation stalled until 2008. The chemical in question, diacetyl, has been linked to lung disease in popcorn plant workers. In recent weeks, the first report surfaced of a consumer potentially contracting bronchiolitis obliterans, better known as “popcorn lung,” from the fumes of microwaving popcorn. According to the National Jewish Medical and Research Centre, the consumer had eaten multiple bags of popcorn every day for a decade. The California legislation would have banned the chemical’s use in the workplace, citing fears that inhaling the familiar buttery aroma could, in fact, be harmful to workers’ health. The butter-mimicking chemical is also found in cake frostings, some baked goods and many other food products. Assemblywoman Sally Lieber, D-Mountain View, author of the legislation, Assembly Bill 514 said, “We could take a huge step towards workers’ safety.” Last month, four of the nation’s leading microwavable popcorn manufacturers announced they would rework the recipes for butter-flavoured microwavable popcorn to remove diacetyl. The companies sell the Orville Redenbacher, Act II, Pop Secret, Jolly Time and Pop Weaver brands. Stephanie Childs, a spokeswoman for popcorn manufacturer ConAgra Foods Inc., said the company is “absolutely confident that microwave popcorn on the shelf table is safe.” She said the chemical was being eliminated to protect employees “who handle very large quantities of diacetyl on a regular basis as well as to address the perception of risk for consumers.” However according to Lieber, this action is not enough. “We certainly welcome their action,” she said. But diacetyl “is still used in a wide variety of other consumer products.” Powerful business interests, including
the California Chamber of Commerce, the California Grocers Association, the California Manufacturers and Technology Association, and the Grocery Manufacturers/Food Products Association, opposed Lieber’s measure, peeling off the support of a half-dozen more moderate, pro-business Democrats.

During the voting, the bill fell short of the required 21 votes. Then in a final vote at 7pm, two Democrats swung their votes in favour of the popcorn-flavouring chemical ban, which resulted in a 20-20 tie. In this situation, the state’s lieutenant governor, John Garamendi, would have the deciding vote. However, before this step could be taken, Republican Sen. George Runner of Lancaster began a procedural manoeuvre in which he actually voted for the bill in order to derail it. “We were all of a sudden confronted with a vote that was 20-20, which meant that it could be broken by the lieutenant governor, and I just was not comfortable with (that),” said Runner, who originally voted against the bill. So Runner says he switched his vote to break the tie, passing the measure by a razor-thin margin, 21-19. He did this so that as a supporter of the measure he could ask for “reconsideration” or a revote — and he did less than 10 minutes later. This revote erased the results of the previous vote and no other vote was taken. If the diacetyl bill were to come up again, said Runner, at least one Republican would simply not vote for the bill, preventing another 20-20 tie. The move put the legislation on hold until January 2008, when the Legislature reconvenes. In the meantime, the California Division of Occupational Safety and Health, which opposed Lieber’s legislation, is developing regulations for the use of diacetyl in the state. Len Welsh, acting chief of Cal-OSHA, said the new regulations are expected in the coming weeks, adding that banning diacetyl altogether would actually have a negative impact on worker safety. California has already found at least eight flavouring workers with fixed obstructive lung disease and 27 more with below-normal lung capacity, he said.

Sacramento Bee, 18 September 2007
http://www.sacbee.com

EPA, Midland reach consensus on dioxin testing
2007-10-03

The U.S. Environmental Protection Agency and the city of Midland have a deal over dioxin testing. The federal agency had asked city for all dioxin sampling data taken within the community from the start of last year to give a more complete picture of Dow Chemical’s dioxin contamination in the area. Now, the EPA says that it will require specific information about sampling protocol and distribution of data but that it won’t require the identification of specific property locations or property owners. “Ultimately, EPA’s interest in this sampling information is to assure that the health of Midland’s residents is protected,” Ralph Dollhopf, associate director of EPA’s Superfund Division said in a press release. “At the same time, EPA respects that the city must balance its concern regarding the health of its citizens with its commitment to protect their privacy. “Having sampling details that we think the city can provide without revealing property owner identity will help EPA confidently evaluate the results of recent soil studies.” As part of the study, soil samples were taken at 145 sites in Midland. The EPA’s information request is part of a larger investigation of dioxin contamination in the Midland area. In August, the agency requested information from Dow Chemical Co. regarding its dioxin sampling at its facility and elsewhere. In addition, EPA is seeking extensive data on numerous other hazardous waste materials produced at Dow’s plant in Midland. As a result of EPA orders in late June, Dow is cleaning up three hot spots in the Tittabawasee River. The agency expects workers to complete the jobs by year’s end and set the stage for additional work downriver. The Dow facility is a 1,900-acre
Green groups are criticising the European Commission over the way it drew up a shortlist of candidates to become the first executive director of the new European chemicals agency (ECHA)...

Industry claims “all-clear” for formaldehyde

According to the European formaldehyde industry association, the use of formaldehyde in consumer products and applications such as embalming does not pose a risk to human health. These claims were made at the end of a 2-day conference in Barcelona, Spain. FormaCare said scientific evidence presented by international academics contradicted the official classification of the chemical as carcinogenic three years ago. The EU still has to evaluate...
formaldehyde under the 1998 biocides directive. It expects to do this in the next 4-5 years.
ENDS Europe Daily, 27 September 2007-10-03
http://www.endseuropedaily.com

EU scientists advise on chemical assessments
2007-10-03
The EU’s scientific committee on health and environmental risks (SCHER) has given advice on two more risk assessments of priority substances carried out under the European “existing chemicals” review scheme. In an opinion on PTBP, the committee said more information was required on the environmental impacts in water due to uncertainties over its endocrine disrupting potential on fish. EU risk assessors recommended adopting provisional conclusions in this area but SCHER did not support this. PTBP is mainly used in the manufacturing of formaldehyde resins. In a separate opinion on flame retardant TCPP, SCHER agreed with the assessors that the chemical has very low bioaccumulation potential. But it stressed it could not comment on key parts of the assessment because they were based on confidential data.
ENDS Europe Daily, 1 October 2007
http://www.endseuropedaily.com

Last ozone-destroying chemicals to be phased out
2007-10-03
The signatory countries if the Montreal Protocol on Substances That Deplete the Ozone Layer look set to phase out one of the last major ozone-destroying chemicals. The imminent deal could be as good for the climate as for ozone, and could mark a turnaround in US willingness to use the international treaty system to deal with climate-related issues. The meeting in Montreal of the 191 member countries marks the 20th anniversary of the protocol, which phases out various chemicals that deplete stratospheric ozone. The main item of business was the phase-out of hydrochlorofluorocarbon-22 (HCFC-22). The substance is kinder to ozone than the chlorofluorocarbons (CFCs) used in aerosol sprays and refrigerants which it replaced, but it too destroys ozone - and is also a greenhouse gas. HCFCs were supposed to be phased out by 2040 under the Montreal Protocol, but its production has soared in recent years as prosperity and the demand for air conditioning has skyrocketed in countries like India and China. Scientific assessments earlier in 2007 concluded that the ozone would recover years earlier if HCFCs were abandoned before the deadline above - and the subsequent reduction in greenhouse gases could be substantially more than that called for by the Kyoto protocol on climate. The meeting in Montreal started out with various proposals for freezing HCFC production in 2011 or 2016 (at 2010 or 2015 levels), followed by intermediate reductions until phase-out in either 2030 or 2040. It is understood that the deal will tend towards more stringent proposals: freezing HCFC production and consumption in 2012, at an average of its levels between 2009 and 2011. Then production must be cut 70% by 2025, with a final phase-out in 2030. It remains unclear whether there will be a formal agreement by the end of the meeting, or whether details will be finalised at another meeting in six months, but delegates considered the outline unlikely to change substantially. Alexander von Bismarck of the Environmental Investigation Agency, a pressure group based in Washington, DC, US, says producers are now likely to ramp up the production of another
HCFC-22 so the levels are as high as possible when the freeze comes in. But the protocol’s signatory countries may soon agree on language to limit this too - and possibly for HCFC replacements to be climate, as well as ozone, friendly. The US had previously opposed combining climate and ozone measures in any agreement - but another possible replacement for HCFC-22, the HFCs, are powerful greenhouse gases. “It's very gratifying,” von Bismarck told New Scientist, “that the international community, including the US and China, seem ready to grasp this opportunity to protect both the climate and the ozone layer.”

New Scientist, 21 September 2007

http://www.newscientist.com
Marketing Jargon Pt 2t

RE-DESIGNED
Previous faults corrected, we hope...

HAND-CRAFTED
Assembly machines operated without gloves

PERFORMANCE PROVEN
Will operate through the warranty period

MEETS ALL STANDARDS
Ours, not yours

ALL SOLID-STATE
Heavy as Hell!

BROADCAST QUALITY
Gives a picture and produces noise

HIGH RELIABILITY
We made it work long enough to ship it

NEW GENERATION
Old design failed, maybe this one will work

MIL-SPEC COMPONENTS
We got a good deal at a government auction

CUSTOMER SERVICE ACROSS THE COUNTRY
You can return it from most airports

UNPRECEDENTED PERFORMANCE
Nothing we ever had before worked THIS way

BUILT TO PRECISION TOLERANCES
We finally got it to fit together

SATISFACTION GUARANTEED
Manufacturer’s satisfaction, upon cashing your cheque

MICROPROCESSOR CONTROLLED
Does things we can’t explain

AEROSPACE TECHNOLOGY
One of our techs was laid off by Boeing

funniestjokes.net

Please note: articles for Janet’s Corner are not original, and come from various sources. Author’s credits are supplied when available.
Autism and Agricultural Pesticides
2007-10-04

The aim of the CDC’s Environmental Public Health Tracking Program is to integrate data from many sources for the purpose of surveillance and research. In a demonstration project by program grantees, a powerful convergence of data on births, social services, and agriculture allows researchers to ask highly focused questions about the relationship between environmental exposures to farm pesticides and autism spectrum disorders (ASDs) in children. The study investigated ASDs in children whose mothers resided close to well-defined sites of agricultural pesticide application in the California Central Valley, a 19-county swath spanning the Sacramento and San Joaquin River valleys. During the study, the researchers identified 465 children born in 1996-1998 who had received ASD-related diagnoses and services. Using the Department of Pesticide regulation data, they were able to determine the mothers’ residential proximity to pesticide applications at the time they gave birth. Data from 6,975 non-ASD children whose mothers had been pregnant in the same time and region served as controls. The researcher team examined every combination of three factors: mother’s residential distance from the site of pesticide application, type of pesticide(s) applied, and stage of gestation at the time of pesticide use. Three time windows were of special interest: the period leading up to and covering central nervous system embryogenesis (1 week before conception through 7 weeks after), the period leading up to and covering neural tube development (4 days before conception through 24 days after) and overall gestation (2 weeks before conception through birth).

Due to the high number of possible combinations and the relatively low number of affected children, the study yielded only a preliminary view of how the three factors may interact. However one group of pesticides did stand out: organochlorines, including the commonly used dicofol and endosulfan, were associated with ASD out to a maternal residential distance of 1,750-meter from the site of application. Dicofol and endosulfan, which are used in the production of cotton, fruit, vegetables, beans, and nuts, account for 98% of the organochlorines applied in the Central Valley region. While the results point to a connection between exposure to the two organochlorines, they did not indicate causality and did not consider other factors that may be involved. For the residences nearest to the organochlorine application sites (where the ASD association was the strongest), data around exposures came from only 8 cases and 105 controls. Of those, the focus is on the quarter who lived nearest sites where the greatest amounts of chemicals were applied. Still, the work, which used data routinely collected for other public uses, marks the need for further analysis of the relationship between organochlorines and ASDs, and lays the groundwork for asking difficult environmental health questions using available geographic, public health, and social services records.

Environmental Health Perspectives, October 2007
http://ehponline.org

Formulating environmentally friendly flame retardants
2007-10-04

A push for manufacturers to design more environmentally friendly flame-retardants has been driven by regulations, consumer demand, and innovation. Polyurethane foam is so flammable that people in the insurance industry sometimes call it “solid gasoline”. Until a few years ago, manufacturers of the inexpensive plastic combined it with brominated flame retardants, typically a PBDE formulation known as Penta BDE, to ensure that it was safe for use in products such as upholstered furniture,
mattresses, carpet padding, and automotive interiors. In 2004, when Penta BDE and another PBDE formulation, Octa BDE, were banned in Europe and discontinued in the U.S. because of concerns related to their persistence, bioavailability, and toxicity, this situation changed significantly. Since this time the industry, has faced enormous pressure to move away from the use of environmentally persistent halogens, such as bromine and chlorine, according to the participants at a conference on environmentally friendly flame-retardants organized in Baltimore by IntertechPira in July. Until 2004, PBDEs were used to prevent such foam padding from catching fire. Now, manufacturers are struggling to find a substitute that works as well and causes no environmental problems. The industry is currently researching new approaches for making flame-retardants, which could result in the development of materials that are inherently resistant to fire. Legislation is driving some of the move away from halogenated flame-retardants. The use of Deca BDE—the only PBDE formulation still used widely—is being challenged in the EU. Furthermore, Deca BDE was recently banned in Washington and Maine, and legislatures in other states, including California, are also considering bills to ban the compound. Consumers are also steering many flame retardant manufacturers towards halogen-free offerings. Since 2002, IKEA has not used PBDEs in its furniture; its products are brominated flame retardant free. According to the non-profit Environmental Working Group, at least 10 other major manufacturers have also made similar announcements about discontinuing or phasing out either PBDEs or all brominated flame retardants; these include Apple, Dell, Ericsson, Hewlett-Packard, IBM, Intel, Motorola, Panasonic, Philips, and Sony.

Computer manufacturers are now competing to be viewed as green, and halogen-based flame-retardants do not have a green image, explains Scott O’Connell, the environmental program manager for Dell. Stephen Tisdale of Intel agrees that his company wants halogen-free materials. “One of the big issues with halogenated materials is the formation of dioxins under poor burning conditions,” such as when electronics products are “recycled” via outdoor burning in the developing world, explains Lauren Heine, a consultant and former director of applied science at the Green Blue Institute, a non-profit that focuses on sustainable design. Some producers of flame retardants complain that it is unfair for them to be pushed away from halogenated flame retardants because of others’ illegal activity, but the electronics manufacturers “do think that you need to look at the less desirable scenarios, such as open burning,” points out Kathleen Vokes, project manager for the U.S. EPA’s Design for the Environment (DfE) program. While there is a growing demand for halogen-free flame-retardants, most bromine used in the world today still goes into flame-retardants, according to the Bromine Science and Environmental Forum, an industry group. Asia has the largest market for non-halogenated flame-retardants, according to Tim Reilly, Sr., of Clariant, a company that makes phosphorus-based flame retardants, which are now often used in place of brominated ones. Clariant estimates that Japan’s market for non-halogenated flame-retardants is growing at 15% a year, Taiwan and China’s at more than 6%, and Korea’s at 3-6%. In comparison, the EU’s market growth is stable at 3-5% a year, and demand is rising at less than 1% a year in the U.S. According to research firm Frost and Sullivan, the key issue with non-halogenated flame-retardants in the U.S., remains the efficacy. “Halogenated flame retardants primarily work in the gas phase by interfering with the complete combustion of carbon to CO2,” says Jeffrey Gilman, a chemist in the Fire Research Division at the National Institute of Standards and Technology (NIST). Finding a replacement for bromine in flame-retardants is a real challenge because bromine-based formulations have the advantage of working across a wide spectrum of plastic products, says Susan Landry of Albemarle, one of the major producers of flame retardants. “Brominated flame retardants provide the best balance between
performance, mechanical properties, process ability, and cost in use,” according to material accessible through Albemarle’s website. Manufacturers of non-halogenated flame-retardants acknowledge that brominated flame-retardants’ properties make them tough to compete with.

For example, the amount of brominated flame retardant that must be added into plastic polymers to pass many flame-retardancy tests is relatively low, at 10-20%, points out Tong Chen of Huber, a company that makes metal hydroxide flame retardants. In comparison, three times as much metal hydroxides must be added to achieve the same flame retardancy. At these levels, the metal hydroxides can interfere with plastic properties; as a result, metal hydroxides cannot be used in all plastic polymers where brominated retardants can, he says. Even so, one of the metal hydroxides, magnesium hydroxide, “is the fastest growing non-halogen flame retardant in the market today,” says James Inns of Flame Retardants Associates, an independent U.S. consulting firm. Although flame retardant formulations are generally identified by the chemical composition of their main constituents, most are actually mixtures optimised to meet the flame-retardancy standards for different classes of plastic polymers, says Gilman. In addition to bromine, phosphorus, and metal hydroxides, these mixtures may include antimony oxides, boron, melamine, melamine salts, silicon dioxide, and silicones as well as a newer class of materials known as “nanoadditives,” he says. Currently NIST is undertaking testing of these nanoadditives to enhance public safety and decrease fire deaths, Gilman says. Numerous layered silicate clay minerals, many of which occur naturally, are now being used in newer flame retardant formulations, he says. Introducing such nanomaterials into these mixtures can render them more desirable for plastics formulators, who generally prefer to add as little flame retardant as possible to maintain the performance of the plastic polymers, Gilman explains. For example, Nanocor is developing nanoclay flame-retardants. The company found that it is quite efficient to combine nanoclay with magnesium hydroxide flame retardants in polyolefin plastics, which are used in a wide variety of consumer applications, according to Tie Lan, general manager for Nanocor’s U.S. operations. The materials burn “at a noticeably reduced rate,” he says. Adding 3% (by weight) of Nanocor’s “nanomer” formulation allows 10% less (by weight) of the magnesium hydroxide formulation to be used, while improving the processing and material properties of polyethylene, polypropylene, and other common polyolefin plastic polymers. Mark Buczek, vice president of advocacy and regulatory affairs for Supresta, says that the company is looking at how to use nanoclays in conjunction with its phosphorus-based flame-retardants. “We’ve struggled with ways to get equal dispersion over large quantities of material,” he says. Nanoclays do “offer a lot of potential, but we’re not there yet.” Other nanomaterials are also under investigation for use as flame-retardants including carbon nanofibers and nanocomposites.

When it became clear that the Penta BDE and Octa BDE formulations would be discontinued in the U.S., EPA’s DfE program put together a Furniture Flame Retardancy Partnership “to better understand fire safety options for the furniture industry,” according to the DfE website. “DfE partnerships support informed substitution. We needed to look at the alternatives and to make sure that they were in fact safer,” explains Heine, who was a member of the partnership’s steering committee. DfE is currently working with manufacturers of printed circuit boards to evaluate the flame retardants used in those products, including tetrabromobisphenol A, a widely used brominated flame retardant. Heine says that DfE’s efforts have led to some important advances, but they also showed that none of the alternatives identified for use in furniture at the time were perfectly green. “It wasn’t obvious which flame-retardants were better from a health and environmental perspective,” she says. In response to these concerns, Heine collaborated with members of
Clean Production Action, a non-profit that helps organisations design greener products and manufacturing processes, to create the Green Screen for Safer Chemicals. The Green Screen evaluates the environmental preferability of chemicals and is based on the principles of green chemistry and the work of the DfE program. It begins with the DfE assessment’s approach but also evaluates the chemicals’ likelihood of causing endocrine disruption and of being very persistent and bioaccumulative (using criteria consistent with the EU’s Registration, Evaluation, Authorisation, and Restriction of Chemicals [REACH] regulation) as well as the chemicals’ degradation products. When the Green Screen was used to evaluate three flame retardants currently being used in television casings, including the Deca BDE formulation, it showed that only one reached the “orange category, which means ‘use, but search for safer alternatives,’” says Mark Rossi, Clean Production Action’s research director. One of the greenest approaches to creating products may be to design materials that are inherently flame-resistant, Rossi says. A study conducts last year by scientists at the University of Massachusetts Amherst, announced that they had synthesized such a plastic polymer. Richard Farris, Bryan Coughlin, and Todd Emrick designed their polymer around bishydroxydeoxybenzoin (BHDB), which releases water vapour when it breaks down in a fire, rather than hazardous gases. The scientists believe that the synthetic polymer has all the desired qualities of a flame-resistant plastic. Emrick says it promises more flexibility and durability than the high-temperature and heat-resistant plastics in current use. NIST is currently assessing BHDB’s suitability for use in less flammable polyurethane foams, Gilman says.

Environmental Science & Technology, 26 September 2007
http://pubs.acs.org/journals/esthag/index.html

New Software to Aid Emergency Care Providers with Radiation Exposure
2007-10-04
New technology will soon assist emergency health care providers with diagnostic information to help physicians make casualty treatment decisions during radiation exposure incidents. Copies of the latest version of the Biodosimetry Assessment Tool (BAT), version 1.0, were distributed to members at the institute’s Board of Governors meeting on 21 September. Army Col. Patricia K. Lillis-Hearne, director of the Armed Forces Radiobiology Research Institute (AFRRI) said, “This is part of the institute’s continuing effort to provide medical professionals with automated information tools and guidance that can be used to assess the level of radiation exposure and determine the appropriate treatment options.” AFRRI Board of Governors members were the first to receive the latest BAT software as one component of AFRRI CD 07-1, Radiation Training and Assessment Tools, 4th edition. The BAT software application and other radiation biological dosimetry tools for emergency responders were developed in a research program led by Dr. William F. Blakely, AFRRI, Scientific Research Department. Using checkboxes and text entries, the user enters information about the exposure situation and a victim’s symptoms, blood counts, and dose level. The program compares that data with established radiation dose responses and provides a concise dose assessment. The new software will be available to download shortly at: www.afrri.usuhs.mil/www/outreach/biodostools.htm#software.
Occupational Health & Safety, 26 September 2007
http://www.ohsonline.com
Polycyclic musks are synthetic fragrances that are added to soap, shampoo, deodorant, cleaning agents, cosmetics, and other consumer products.
Panic Attacks Linked To Heart Attack Risk In Women

2007-10-04

A new study has found that older women who experience at least one major panic attack may have an increased risk of having a heart attack or stroke and an increased risk of death within 5 years. According to the background information on this study, panic attacks involve the sudden development of fear, anxiety or extreme discomfort accompanied by four or more additional symptoms. They may occur sporadically or as part of an anxiety disorder, such as panic disorder, social anxiety disorder or phobias. During the study, Jordan W. Smoller, M.D., Sc.D., of Massachusetts General Hospital, Boston, and colleagues, examined 3,369 healthy postmenopausal women (age 51 to 83, average age 65.9). When they entered the study between 1997 and 2000, the women filled out a questionnaire about the occurrence of panic attacks in the previous six months. They were then followed for an average of 5.3 years to see whether they had a heart attack or stroke or died from any cause. Approximately 10 percent of the women reported having a full-blown panic attack in the six months prior to the study. After adjusting for other cardiovascular risk factors, the researchers observed that having one or more panic attacks was associated with four times the risk of myocardial infarction (heart attack), three times the risk of having a heart attack or stroke and nearly twice the risk of death from any cause. These associations remained after controlling for depression, suggesting that panic attacks may be a separate, independent risk factor for cardiovascular events. The author notes that the study findings add panic attacks to the list of emotions and psychiatric symptoms that have already been linked to cardiovascular risk, including depression, anger and hostility. Panic attacks could be associated with other cardiovascular risk factors, such as hypertension. Alternatively, anxiety could contribute to adverse cardiovascular effects, such as coronary artery spasm, tendency toward increased blood clotting or disturbances in heart rhythm. “These results suggest that panic anxiety is a marker for increased risk of cardiovascular morbidity and mortality among postmenopausal women,” the authors conclude. “Future studies are needed to clarify the causal connection, if any, between panic attacks and cardiovascular events. Our results imply, however, that older women with a recent history of panic attacks represent a subgroup at elevated risk of myocardial infarction and stroke in whom careful monitoring and cardiovascular risk reduction may be particularly important.”

Science Daily, 2 October 2007

http://www.sciencedaily.com

Clue to chemistry of mini-strokes

2007-10-04

According to a new study by researchers at John Hopkins University, elevated levels of uric acid may be responsible for mini-strokes that potentially cause mental decline in ageing adults. Brain scans showed mini-strokes - white matter hypersensitivities (WMHs) - were more common among elderly patients with higher uric acid levels. The researcher believe that diet, exercise and drugs could be used to cut levels of the compound - which causes gout. However, they caution that more research is required. Having found that uric acid levels are linked to both mild cognitive decline and mini strokes we need to learn how these are related. WMHs are small dead areas of the brain that occur when brain cells are deprived of oxygen. By themselves, they are barely detectable. However, over time they are thought to contribute to mental decline. Uric acid is known to trigger gout, a condition that causes pain and disability in the feet and toes, although its effect on
the brain remains unclear. Research has suggested that it might protect against Parkinson’s and Alzheimer’s disease, but it is also thought that elevated levels associated with obesity, heart disease and diabetes make a stroke more likely. During the study, the research team from John Hopkins University, analysed MRI scans of 85 men and 92 women between 20 and 92 years of age. They found that those with moderately elevated levels of uric acid had an average of 2.6 times the volume of WHM than those with average or low uric acid. Further analysis indicated that the subjects that were over 60 and had elevated levels of uric acid, had up to five times the volume of WMH. Previous studies by the same team have reported that elevated uric acid levels were linked to poor performance on memory and speed of thought tests. Lead researcher Dr David Schretlen said: “Having found that uric acid levels are linked to both mild cognitive decline and mini strokes we need to learn how these are related. “We have to find out which of these factors steers the boat.” Dr Isabel Lee, of the Stroke Association, said: “Whilst this study increases our knowledge of the link between uric acid levels and strokes as well as vascular dementia it does not change clinical practice. “This study is small and much more research needs to be done before this can happen.”

BBC News, 1 October 2007
http://news.bbc.co.uk/hi/english/health

Heart disease, colon cancer linked in study
2007-10-04
According to a new study, patients showing signs of heart disease have almost double the risk of also having colon cancer. The researchers say that unhealthy habits and inflammation may be at the root of both. The association between heart disease, the single leading cause of death in industrialised countries, and the second most common type of cancer was confirmed in a study of more than 600 patients evaluated at the University of Hong Kong. Results from previous studies have reported the increased likelihood of heart disease and colon cancer in the same patients, the study said. The two illnesses share several risk factors: smoking, high-fat diet, obesity, diabetes, high blood pressure, and sedentary lifestyle. “Both colorectal (tumours) and (coronary artery disease) probably develop through the mechanism of chronic inflammation,” study author Dr. Annie On Chan of the University of Hong Kong wrote in the Journal of the American Medical Association. During the study, the researchers found that of the patients whose examinations showed at least a 50 percent narrowing of one of the coronary arteries feeding the heart, 34 percent also had cancerous colon tumours. That compared to some 20 percent of patients found to have tumours who were free of heart disease. The family of cholesterol-lowering drugs called statins appear to have a deterrent effect on both illnesses, perhaps because the drugs reduce inflammation. In addition, aspirin seems to reduce the risk, the study said.

Reuters AlertNet, 25 September 2007
http://www.alertnet.org

DIY lab scanner made from standard CD drive
2007-10-04
Spanish researchers have discovered that by fixing an additional two light sensors to a normal CD or DVD drive, it can be transformed into a highly accurate scanner for chemical or medical tests. The team has developed a modified CD drive that detected tiny quantities of pesticide in samples placed on top of an ordinary compact disk. Biologists and chemists often detect
and measure compounds of interest, such as disease pathogens in blood or pollutants in water, by triggering interactions between these compounds and known proteins and antibodies. These immunoassay tests produce further compounds that can then be measured accurately, typically using light. However, these machines that detect light are generally expensive, normally costing between 30,000 and 60,000 euros, says Angel Maquieira, of the Polytechnic University of Valencia, Spain.

Maquieira and colleagues found that an off-the-shelf CD drive can be modified to do the same job. While a laboratory machine has to precisely scan samples with light and record the results, a CD player uses similar precision to read the tiny pits that encode music or data on a disk. “The main advantages of using a CD reader are versatility, simplicity, ease of operation, and portability for point-of-need applications,” Maquieira told New Scientist. During the study, the researchers soldered two extra light sensors inside a CD player, and used software to control the way the device “plays” a disk. The first sensor identifies the sector of a disk containing a sample using black marks on the edge of the disk. The second analyses the sample itself, measuring the amount of laser light that is able to pass through the disk. The off-the-shelf disks used normally reflect around 30% of the laser beam onto the reading head, with the rest passing through.

Using their modified drive, the researchers conducted experiment to detect traces of three different pesticides. A sample - half a millimetre across on a disk - was treated normally, using a set of reactions that produce an amount of dye or silver that is inversely proportional to the amount of pesticide in the sample. The amount of laser light that passed through the disk to the second sensor indicated the levels of dye or silver. The modified drive was thus able to detect levels of pesticide as low as 0.02 micrograms per litre. Although the hacked device lags behind the performance of specialised machines, it is accurate enough for many lab tasks, the team says. Other researchers have previously used the reading head from a CD drive to scan chemical samples. Using the whole drive is both faster and cheaper, Maquieira says. He adds that thousands of samples could be placed on a single disk. “Currently, working at minimum capacity, we can manage 3072 dots, but the real capacity is much higher - more than 10000 per CD,” he says. Patrick Corran, who uses immunoassays at the London School of Hygiene and Tropical Medicine, says modified CD drives could be perfect for use in poorer countries. “I study malaria and I’m always aware of the importance of making equipment available to developing countries,” he said. “A cheap-and cheerful device made from mass produced and easily available products could help with that.” However, Corran believes that the Spanish team’s procedure needs to be developed further. “They still do part of the assay in a normal plate. Until the whole thing can be done on a CD it doesn’t have a great technical advantage.” Corran adds that future disk drives may be even more useful, since next-generation systems like Blu-ray and HD-DVD use shorter wavelength lasers that are closer to those found inside laboratory machines.

New Scientist, 25 September 2007
http://www.newscientist.com

DDT and Breast Cancer Revisited
2007-10-04
Rachel Carson made the initial claim that DDT caused breast cancer in the 1962 best seller Silent Spring. Subsequent studies, including a meta-analysis published in EHP [Lupen-Cervantes et al. 112:207-214], downplayed the connection. However, new research has discovered evidence that could potentially link DDT with breast cancer in women [EHP 115:1406-1414; Cohn et al]. The findings come at a time when DDT is once again being promoted...
as a tool to combat malaria. Beginning in the mid-1940’s, DDT was widely used as a pesticide. While the chemical was highly effective in reducing the incidence of malaria, scientists began to suspect it was damaging to the environment, specifically to birds of prey in which the DDT metabolite DDE caused thinning of eggshells. Reacting to a growing fear of pesticides, some suspected a link to human cancer. In the early 1970s, the United States and many other countries banned the use of DDT. Over the years, there have been many chemical substitutes developed, but few have proven to be as cheap or effective at controlling malaria as DDT. At the same time, most studies conducted since the ban have typically failed to establish a link between exposure to DDT and human cancer. Recently, after weighing up the perceived health risks against the possible benefits, the WHO and other agencies have endorsed the indoor spraying of DDT in areas with high rates of malaria. However, the authors of the latest study believe that it is premature to suggest there is no link between DDT and human illness, specifically breast cancer in women.

They observed that earlier studies were limited by their inability to consider subjects’ age at the time of exposure or measure exposure at a young age during the time DDT was in widespread use. Based on animal studies showing that early exposure to toxicants is often most strongly associated with illness, the authors hypothesised that women who were exposed to DDT in childhood or adolescence might show a higher evidence of breast cancer than the general exposed population. During the study, the researchers analysed serum samples taken from women who sought obstetric care between 1959 and 1967. These women had donated blood as part of the Child Health and Development Studies. The mean age of the women was 26 years. Most would have been 4-12 years old during the period 1945-1959, when DDT was in widest use in the United States. The researchers analysed 129 case-control pairs, cases being defined as women subsequently diagnosed with breast cancer before age 50. The results indicated that high serum concentrations of p,p’-DDT, the primary component of DDT, predicted a fivefold increased risk of breast cancer among women who were born after 1931. Women who were born in 1931 or earlier showed no increased risk of breast cancer. The authors concluded that based on the findings from the study, it is too early to decide that DDT exposure has little public health significance for breast cancer. They state that many women in the United States who were exposed to DDT in their youth have not yet reached age 50, the age above which women have the greatest risk of evidencing breast cancer.

Environmental Health Perspectives, October 2007
http://ehponline.org

Drunk, not deaf
2007-10-04
A new study has suggested that if you are having a hard time hearing conversation at a bar, it may not be because of the noise. The UK researchers found that alcohol seems to temporarily drain a person’s hearing - particularly when it comes to discerning the sounds of conversation. During the study, 30 healthy volunteers were examined and the researchers found that as participants drank, their hearing became less acute. Lower-frequency hearing, which is necessary for discerning speech, suffered the most, the researchers report in the online journal BMC Ear, Nose and Throat Disorders. It’s a “well observed phenomenon” that alcohol seems to build people’s tolerance to loud noise, according to the study authors, led by Tahwinder Upile of the University College London Hospitals. To study the short-term effects of alcohol on hearing, Upile’s team recruited healthy adults between the ages of 20 and 40 who had no history of hearing problems. The volunteers
had their hearing tested before and after having a predetermined number of drinks in the research lab. The researchers observed that in general, the higher a volunteer’s alcohol level - as measured by breath test -- the greater the deterioration in hearing. The hearing loss tended to be more significant in relatively older volunteers, as well as those who said they had a history of heavy drinking. It’s not clear why drinking may have this effect, but alcohol could either damage the auditory nerves or affect the brain’s processing of sound, according to Upile’s team. In this study, the hearing loss was short-lived. Volunteers who returned for tests the following week were back to their normal hearing levels. However, it’s possible that regular drinking could alter people’s hearing over time, the researchers note.

“There remains a huge scope for further research,” they conclude.
The Age, 2 October 2007
http://www.theage.com.au

High-carb diet may help you think faster
2007-10-04
A new study has shown that both a low-carbohydrate/high-fat diet and a high-carbohydrate/low-fat diet improve weight loss, enhance mood, and speed thinking. However, the low-carb diet may offer less benefit in terms of the rate of cognitive processing. “In overweight and obese patients, following an energy-restricted dietary plan for weight loss is associated with improvements in mood, regardless of macronutrient composition,” Dr. Grant D. Brinkworth said. Moreover, while both a high- and low-carbohydrate diets seem to boost the speed of cognitive processing, “the interesting result was that compared to the high-carbohydrate diet, subjects consuming the low-carbohydrate diet had a smaller improvement,” Brinkworth noted. During the study, Brinkworth, of the Commonwealth Scientific and Industrial Research Organisation-Human Nutrition, in Adelaide, Australia and colleagues compared mood and cognitive function in overweight or obese, but otherwise healthy, men and women who were between 24 to 64 years old. Over an eight-week period, the participants followed one of two diets of similar caloric and macronutrient content, the researchers reported. The low-carbohydrate diet contained 35 percent total protein, 61 percent total fat (20 percent saturated fat) and 4 percent total carbohydrate. The high-carbohydrate diet consisted of 24 percent total protein, 30 percent total fat (less than 8 percent from saturated fat), and 46 percent total carbohydrate. The results showed no changes in mood among the 93 participants consuming either the low- or high-carbohydrate diet for the study duration. However, the researchers did find a small between-group difference, favouring the high-carb dieters, in the speed in which participants performed intelligence and reasoning tests. Brinkworth says that these findings suggest that “very low carbohydrate diets may offer less benefit than a high carbohydrate diet for improving cognitive function.” The researchers say that further research is required to determine whether similar results occur with similar diets of longer duration.
Scientific American, 28 September 2007
http://www.sciam.com

Ozone Breaks Down Lungs’ Defences
2007-10-04
New research has found that ozone, a major component of urban air pollution, shuts down early immune responses in the lungs, which in turn makes the lung more vulnerable to bacteria and other foreign invaders. While it is well documented that exposure to ozone is associated with increased cardiovascular and pulmonary hospitalisations and deaths, the
actual mechanisms involved has not been identified. This study, by Duke University Medical Centre pulmonary researchers, may provide some answers. During their study, they found that mice exposed to unhealthy ozone levels showed amplified lung injury in response to bacterial toxins. In addition, the rodents showed increased “programmed cell death” of the type of innate immune system cells that normally devour foreign invaders and keep the airways clear. The innate immune system -- the most primitive part of the body’s defences -- reacts indiscriminately to any invader. “Small amounts of inhaled foreign material can be relatively harmless, since they stimulate an appropriate innate immune response that protects the lungs,” study lead author and pulmonologist Dr. John Hollingsworth, said in a prepared statement. “However, it appears that ozone causes the innate immune system to overreact, killing key immune cells, and possibly making the lung more susceptible to subsequent invaders, such as bacteria,” he said.

Forbes.com, 1 October 2007-10-03
http://www.forbes.com

Occupational exposures in farming and industry may be linked to death from autoimmune disease
2007-10-04
In a new study, researchers have examined the possible association between occupation and the risk of dying from systemic autoimmune diseases. They found that occupational exposures in farming and industry may be linked to higher death rates from these diseases. More than 8 million Americans suffer from autoimmune diseases, in which the immune system attacks the body’s own tissues and several occupational exposures have been linked to systemic autoimmune diseases, which affect multiple organs. The new study examined the possible associations between occupation and the risk of dying from systemic autoimmune diseases and found that occupational exposures in farming and industry may be linked to higher death rates from these diseases. During the study, led by L.S. Gold and A.J. De Roos, of the Fred Hutchinson Cancer Research Centre in Seattle, WA, the researchers examined death certificate data from 26 states from 1984 to 1998. Any cases that listed a systemic autoimmune disease (for example, rheumatoid arthritis) as a cause of death, were included, as were disease types with a suspected systemic autoimmune disease origin (such as unspecified connective tissue disorder). In addition, five control subjects matched by age, sex, race, year of death and geographic region were selected. The researchers established each person’s longest-held occupation from the “usual occupation” listed on the death certificate. They also examined specific exposures based on occupation and industry. These included asbestos, solvents, benzene, pesticides and other substances. Occupations involving significant exposure to the public (such as teachers, and waiters/waitresses) or animals were also tracked. The results demonstrated that some occupations involving exposure to the public (such as nurses and teachers) were associated with an increased risk of dying from a systemic autoimmune disease but this was not the case with all jobs involving public exposure (for example food service jobs).

Farmers showed increased risk of death from systemic autoimmune disease, particularly for those who worked with crops versus livestock. In addition, several industrial occupations such as mining and textile machine operators, as well as timber cutting and logging had an increased risk of death from this group of diseases. Following further analysis, the researchers found that the same occupations and exposures were present in those who were older than the typical retirement age when they died, “implying that the occupational
exposures were involved in a chronic pathogenic process leading to either disease incidence or slow progression of existing autoimmunity,” according to the authors. They suggest that the higher risk associated with jobs involving public contact may be due to exposure to multiple infectious agents leading to an autoimmune response. The authors note that autoimmune diseases tend to be underreported on death certificates, and that the increased risk seen with certain occupations, such as teachers, may be due to the fact that these individuals have extensive health benefits even after retirement, and therefore better access to care. This would also help explain why other occupations that involve public contact but lower health insurance coverage, such as waiter/waitress, seemed to have a lower risk of death from autoimmune disease. However, not all the occupational associations they found are expected to be affected by insurance status. “The size of our study allowed us to estimate associations between specific occupations and death from autoimmune diseases and to generate hypotheses that will be useful as starting points for future studies in this area,” the authors conclude. They note that future studies should focus on obtaining more detailed occupational histories from the groups found to be at increased risk.

News-medical, 30 September 2007
http://www.news-medical.net

A Spicy Recipe for Pain Relief
2007-10-04
Capsaicin, the compound that puts the fire in jalapenos and habaneros, has already been marketed as a balm for stiff joints and arthritis. Now, a new study harnesses capsaicin’s special affinity for pain-sensing neurons in a more clever way, using it to open tiny channels on the cells’ surfaces so that another drug—an anaesthetic—can get inside. The work could lead to treatments that dull pain without causing numbness or temporary paralysis. Many local anaesthetics work by blocking sodium channels, pores on the surface of neurons that let ions flow into the cells to generate the electrical impulses neurons use to communicate. However, blocking these sodium channels blocks more than just pain. It also shuts down nerves carrying touch information, as well as those that control movement. That’s why people sometimes leave the dentist’s office drooling, slurring their speech, and unable to feel their tongues. While thinking about how to selectively target pain neurons, neuroscientist Bruce Bean at Harvard Medical School came across recent work on capsaicin, which binds to and opens so-called TRPV-1 channels on the surface of pain-sensitive neurons. Popping the TRPV-1 hatches allows positively charged ions into the neuron and prompts it to fire. But Bean noticed that the pore through the TRPV-1 channel was unusually wide—perhaps even wide enough to let an anaesthetic drug through. In conjunction with Harvard colleagues Alexander Binshtok and Clifford Woolf, Bean tested the idea in mice, using a drug called QX-314.

Like other local anaesthetics, the drug blocks sodium channels, but only if it could get inside a cell, which it can’t do on its own. So it was no surprise that QX-314 alone injected near the sciatic nerve made no difference in mice’s responses to a painful poke or heat applied to a hind limb. However, when the researchers followed QX-314 with an injection of capsaicin to open the TRPV-1 channels, mice withstood more poking or heat before withdrawing their paw, an analgesic effect that lasted about 90 minutes. Moreover, this two-injection treatment did not impair hind limb movement, as did injections of lidocaine, a conventional, membrane-crossing local anaesthetic, the team reported. Bean believes the approach could ultimately be useful when doctor’s want to block pain without causing generalised numbness or preventing movement. “The one that comes to mind immediately is childbirth,” he says.
“It’s a very simple but elegant idea,” says David Julius, a neurophysiologist at the University of California, San Francisco. Even so, Julius cautions that there’s no guarantee that the method will work well in people. One question, he says, is whether the QX-314 injection would sufficiently blunt the burning pain of capsaicin. Bean says he plans to investigate other sodium channel blockers that might do the job more effectively than QX-314.

Science Now, 3 October 2007
http://sciencenow.sciencemag.org

Herbicide leak in water feared
2007-10-04
A Tasmanian farmer is demanding compensation, believed to be at least $150,000, after herbicides sprayed on a Gunns forest plantation site apparently washed on to adjoining pasture. The state Government is investigating whether any of the herbicides, including one chemical linked to crop contamination in the US, has contaminated waterways. Local residents and community groups have called for independent tests to be conducted to show whether drinking water had been polluted. The concerns centre on a cattle-grazing property at Dairy Plains, Western Creek, in the state’s rural north. Residents’ groups say heavy rains in August washed herbicides applied to a Gunns plantation site in late June on to land owned by farmer Michael Terry. Mr Terry is understood to have lost pasture. Samples have been taken from a large dam on the property that is feared to have been contaminated. Local community groups - Western Rivers Preservation Trust and the Meander Valley Action Group - said they feared the Western Creek, Meander River and South Esk River had been contaminated. Rod Hutchins, of the Meander Valley Action Group, said these waterways provided water for towns such as Deloraine and Westbury, and the West Tamar, as well as emergency supplies for Launceston. Mr Terry would not comment, but confirmed that he was negotiating a settlement with Gunns. “I’m in negotiation with Gunns at the moment and don’t want to comment,” Mr Terry said. It is understood he agists dairy and beef cattle on his land. Gunns have also remained tight-lipped. “Gunns is continuing to comply with all relevant regulations,” a spokesman said. The state Department of Primary Industry and Water confirmed it was investigating possible contamination.

“The DPIW spray unit is investigating whether there has been any contamination of a waterway in the Western Creek area,” spokesman Simon de Salis said. Mr Hutchins said it was one of about eight examples of herbicide spray from forestry plantations affecting neighbouring properties in the state’s north and east in the past six months. He believed two herbicides had been sprayed on the Western Plains plantation land by Gunns: Oust and Glyphosate. “There is meant to be a buffer zone but they sprayed right up to the fence and the wash-off after heavy rains went as far as 1.5km into the adjoining property and into a dam used for irrigation,” Mr Hutchins said. While Mr Terry would not comment on the negotiations with Gunns, Mr Hutchins said he was aware that company director, and former Liberal premier, Robin Gray was among Gunns’ representatives talking to the farmer. Neil Graham, president of the Western Rivers Preservation Trust, questioned Gunns’ environmental credentials. “How can Gunns hope to establish a pulp mill with environmental guidelines when they can’t even adhere to guidelines in respect to establishing simple plantations?” he said. The incident has inflamed local opposition to forest plantations, which have expanded rapidly in recent years, fuelled by tax-friendly investment schemes, taking over farmland. “They are destroying our way of life,” Mr Hutchins said. “Farmers get offers for their land that are too good to refuse and with them goes their families, and with them the services and community. There is also
concern about whether the use of these chemicals is linked to the higher incidence of certain cancers in the north of Tasmania.”

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Legionnaires’ disease still baffles experts
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Legionnaires got its name 31 years ago, when dozens of attendees at an American Legion’s convention in Philadelphia came down with an inexplicable illness that caught experts off guard. To this day, Legionnaires’ disease is a mystery. It is known that the disease is caused by the bacterium Legionella, which is a water-loving microbe that thrives in soil and is capable of colonising in air conditioning systems, hot water tanks and other drinking water systems. What they’ve begun to more precisely document is its ubiquity in the environment and the various ways it can be transmitted. A recent cluster of Legionnaires’ cases on Long Island has triggered widespread testing at two residential facilities for elderly people. Results of sampling from one of those centres, Sunharbor, a nursing home in Roslyn Heights where two residents with the disease died, has traced Legionella to a cooling tower involved in the air conditioning system. The tower is not a usual hiding place for the bug, said Janet Stout, director of the special pathogens laboratory at the University of Pittsburgh where scientists focus on the study of Legionella. “The majority of cases are caused by colonies in warm-water distribution systems because there is a presence of organic nutrients, what we would call biofilm,” she said. Stout said Legionella is one of the easiest bugs to prevent in health care settings just by being vigilant. However, she and her colleague’s estimate that 50 percent to 70 percent of all buildings worldwide, health care institutions included, have water systems that are contaminated by Legionella. “I always described the family of Legionella as a big one,” said Stout, who, along with her colleague, Dr. Victor Yu, a professor of medicine at the university, is calling for more rigorous testing and treatment standards, steps that can prevent unnecessary infections in hospitals and nursing homes. In all, there are 41 subtypes of Legionella, Stout said.

“One member, Legionella pneumophila, causes 90 percent of all infections, and it is the one that caused the outbreak in Philadelphia in 1976,” Stout said. In the past week, state health officials have confirmed seven cases of Legionnaires’ disease on Long Island. Samples are still being evaluated from the Sunrise Assisted Living facility in Smithtown, where five residents were infected, including one who died. State and local health officials say because the residents who died were elderly and suffered from numerous medical conditions Legionnaires’ may not be the sole cause of death. Stout said even when the source of the bacteria is found, it is not always a simple task determining exactly how people become infected. Dr. Pascal Imperato, who chairs the department of preventive medicine at SUNY Downstate Brooklyn, said the notion that people contract Legionnaires’ through showering is one of the enduring myths about the disease. Imperato, who was New York City’s health commissioner in 1976, was one of the experts called upon to help solve the Legionnaires’ disease mystery. He said much of what was learned about Legionella during the outbreak evolved from intense brainstorming by scientists and public health officials who wanted to quickly understand how the convention-goers were infected -- and with what kind of organisms. A clue arose from a scant mention in the scientific literature of the late 1940s, which discussed a little-known bacterium with the potential to cause serious disease. Now, experts are aware that elderly people in nursing homes can contract the organism through feeding tubes and other medical apparatus.
that would allow people to aspirate the microbe. Legionella is not spread
person to person.
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