

NEWS in Science and Technology

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The following is an Executive Summary of the Academy's quarterly Bulletin (Vol. 19,2) that includes topics and issues in science and technology deemed by the Academy to be both timely and relevant to Connecticut's interests. Each item is briefly summarized from press releases and reports of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Hyperlinks are included to the original online source, where more detailed information is available.

NOTE: Online versions of this newsletter and the Bulletin are available on the Academy website at www.ctcase.org.

FEATURE: ADVANCES IN FORENSICS

➤ Advances in Forensics Provide Creative Tools for Solving Crimes

Forensics — the application of science to matters of law — has made great strides in Connecticut in recent years. The state has gained visibility in the field through the work of the Connecticut State Police Forensic Science Laboratory and the Henry C. Lee Institute for Forensic Science at the University of New Haven. The article reports on:

- The Henry C. Lee Institute for Forensic Science:
 - Established in 1975.
 - National Crime Scene Training Center established in 2003.
 - Working to standardize procedures for collecting and analyzing evidence.
 - Conducting on-going research into DNA analysis, biological evidence, arson, cyber crime, low-cost teleforensic technology.
- State Computer Crimes and Electronic Evidence Unit:
 - Established in 1999 in Meriden.
 - Enables state police to examine computer records, collect evidence from email and other digital files.
- Forensic DNA Analysis:
 - Introduced in 1985.
 - Polymerase chain reaction (PCR) allows analysis of minute amounts of DNA.
 - Advances in miniaturization and microchip technologies yielding "impressive" results.
- Data Mining:
 - Databases such as CODIS and AFIS help crack previously unsolvable cases.
 - Expansion of state's sex-offender DNA database will help solve cold cases.
- Fingerprint Techniques and Image Enhancement Technologies:
 - 250 chemicals and instrumental techniques, light, and lasers improve ability to detect latent fingerprints.
 - Computers enhance videotape, photographs.
- At Connecticut Center for Science & Exploration, visitors will be able to perform real DNA tests and try to crack cases.

[See www.ctcase.org/bulletin/19_2/forensics.html for an expanded version of this article]

BUSINESS & INDUSTRY

➤ Funding Urged for National Aerospace Initiative

The National Aerospace Initiative (NAI), a joint effort of the US Department of Defense (DOD) and the National Aeronautics and Space Administration (NASA), is effective in pursuing technologies necessary for future space launch needs and military operations, according to a new report from the National Research Council. The report finds:

- NASA and DOD should continue to lead in three critical areas:
 - high-speed hypersonics.
 - space access.
 - space technology.
- Need for comprehensive research and development plan to undertake activities from fundamental research to flight demonstration.
- Need for stable and predictable funding sources to allow students, faculty, government researchers and industry leaders to perform long-term research on reusable launch vehicles and aerospace propulsion and power.

[See <http://books.nap.edu/catalog/10980.html>]

GENERAL

➤ Joint Workshops on Media and Terrorism

The US Department of Homeland Security has announced plans for a series of interactive workshops, developed and hosted with the assistance of the National Academies and the Radio-Television News Directors Foundation, on the crucial role of the media in terrorism response.

- Workshops will take place in 10 locations across the country between July 2004 and July 2005.
- Sessions will include "table-top" terrorism scenario, discussions of biological, chemical, radiological and nuclear threats.
- National Academies will provide information on weapons of mass destruction including fact sheets and list of experts who can provide reliable information in time of crisis.

[See <http://www.dhs.gov/dhspublic/display?content=3549>]

or

[<http://www.nae.edu/nae/naehome.nsf/weblinks/MKEZ-576QMA?OpenDocument>]

➤ EPA Releases New Fuel Economy Figures

According to new fuel economy figures released by the US Environmental Protection Agency (EPA) in May of 2004, the average fuel economy for cars, trucks, and sport utility vehicles in the United States has remained relatively unchanged since 1997. The average fuel economy for all 2004 light-duty vehicles was 20.8 mpg, nearly equal to last year's 20.7 mpg. US fuel economy peaked in 1988 at 22.1 mpg. The agency attributes the decline in part to the increasing popularity of light-duty trucks, which constituted 48% of all vehicle sales according to EPA estimates.

HEALTH

➤ Indoor Mold, Dampness Linked to Asthma, Respiratory Problems

According to a new report from the Institute of Medicine, scientific evidence links mold and other factors related to damp conditions in homes and other buildings to asthma symptoms in some asthmatics as well as to coughing, wheezing, and other upper respiratory tract symptoms in otherwise healthy people. The report finds:

- Scientific evidence shows no "clear, causal relationship" between either interior dampness or mold and a wide range of other health complaints linked to them, but possibility of link cannot be ruled out
- Excessive indoor dampness should be addressed through a broad range of public health initiatives as well as changes in how buildings are designed, constructed, and maintained.
- Current animal studies of short-term, high-level inhalation exposures to microbial toxins should be supplemented with new research that evaluates the effects of long-term exposure at lower concentrations.
- Training curricula on why dampness problems occur and how to prevent them should be produced and disseminated.
- Guidelines for preventing indoor dampness should be developed at the national level.
- Better standardized methods for assessing human exposure to organisms and chemicals linked to dampness.

[See <http://books.nap.edu/catalog/11011.html>]

➤ No Link Found Between Autism, Vaccines

Neither the mercury-based vaccine preservative thimerosal nor the measles-mumps-rubella (MMR) vaccine is associated with autism, according to a new Institute of Medicine report. The report, based on a review of clinical and epidemiological studies, found that:

- Research into the causes of autism should be directed towards those lines of inquiry that are supported by current knowledge and evidence and that offer some promise for an answer.
- While some information suggests that autism rates may be rising, it is not clear whether the increase is real or due to factors such as heightened awareness of the disorder or use of a broader diagnostic definition.
- Thimerosal is still used in some adult vaccines but vaccines recommended for universal use in infants and children are available in forms that have no or only trace amounts.

[See <http://books.nap.edu/catalog/10997.html>]

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