December 3, 2012

# Environews #3, Dec.3, 2012

Richard B. Philp, *University of Western Ontario*

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**BITUMEN, BUGS, BOOKS AND "THE BENDS":** When I was doing diving medical research in Freeport, The Bahamas, I had the privilege of getting to know Bob Wicklund, Director of the Undersea Hydrolab habitat; a facility that allowed divers to live for several days at a depth of about 15 meters (50 feet) and make unlimited dives around the facility with a technique called saturation diving. Bob has recently written a book, "Eyes in the Sea" (1) that details his remarkable diving career. One expedition in 1974 involved a saturation dive in the Canadian Arctic beneath 7 feet (2 meters) of ice. This was organized by Canadian physician, diver and explorer Joe MacInnis. The objective was to live in the sea for 24 hours in an undersea habitat and carry out observations of sea life and conduct some experiments. The divers breathed oxygen before returning to the surface to avoid the bends. This precaution was sufficient due to the shallow nature of the dive.

Traces of 2, 4-D, the herbicide, were found in shallow depressions gouged by the ice in the sea floor. This was one of the earliest observations of pesticides in the Arctic where they had never been used. Traces of oil were also found, believed to have come from the numerous ships that plied these waters. Another experiment involved releasing crude oil just beneath the ice cover and observing its behaviour. It took about seven days for the oil to migrate through the ice and reach the surface; a rate of about one foot per day. It was noted that the environmental consequences of an underwater oil spill in the Arctic could be catastrophic. That was almost 40 years ago.

Clive Cussler another diver, underwater explorer and prolific author, published a novel over 30 years ago (2) in which he (unwittingly?) predicted the current looming financial crisis and energy shortfall. He noted the need to exploit shale oil and to develop alternative energy sources, noting that they couldn't completely fill the shortfall. All of this should sound remarkably familiar. It seems that people who spend a lot of time on or under the sea develop a clearer picture of what our species is doing to this Earth. I would like to include myself in that group as I have worked in and on the sea many times as well as sailing on the Great Lakes.

Cussler, when he wrote his 1981 book, could have known neither of Dick Cheney, former Chair of Halliburton Oil and U.S. Vice President, nor of the Halliburton loophole passed in 2005. It exempts fracking for gas from the rules and regulations of the U.S. Clean Water Act (3). The result has been exploding water wells, water that can be ignited, the seeping of toxic fracking fluid into water tables and the necessity to evacuate some homes. See reference (4) for detailed coverage of this issue. President Obama was attempting to close the Halliburton loophole before the protracted U.S. election process intervened.

Staying with the sea, researchers recently published an article (5) in "Science" detailing how fluctuations in ocean temperature affect the behaviour and productivity of phytoplankton. They predict that rising ocean temperatures will cause a poleward shift of the thermal niches for

phytoplankton and a decline in tropical diversity unless adaptations occur. Plankton constitute the foundation of the entire ocean food web. A collapse of the planktonic food web would have serious repercussion. These 'bugs in the sea' support commercial fishing, help control pollution, modulate climate and perform a host of other useful functions.

**WHODA THOT**: A recent issue of Rapport (6), the house organ of the Schulich School of Medicine and Dentistry (U. Western Ont.), notes that across Canada a single surgical procedure, a total knee replacement, annually generates enough garbage to fill a fleet of garbage trucks 10 across and 200 deep. Much of this waste involves packs of surgical supplies that were opened but not used. In 2010 group of second year medical students Jen Bondy, Yoan Kagoma and Nathan Stall (all now graduated) launched a recovery program aimed at saving the material and sending it to developing countries. It's nice to hear some good news for a change.

## REFERENCES


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