

TGIF Taking Great Ideas Forward

Improving Northern Capital - Sustainable Development in the Northern Tier

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Herbster, WI August 8th – Volume 4: Number 32 [Back Issues](#)

“Life's a hobby.”

-Joshua Lederberg-

MEETINGS and EVENTS:

Links will provide additional information. Dates for recent additions are in **bold**.

<i>What</i>	<i>Date</i>	<i>Time</i>	<i>Where</i>
BCEDC Board Meeting	August 11 th	10:00 – Noon	Washburn Library
Conservation Voters Listening Session	August 14 th	6:30-8:00 PM	Northern Great Lakes Visitor Center - Ashland
2008 Resource Rendezvous	August 28	9:00 AM – 3:00 PM	Marshfield Clinic
Lake Superior Binational Forum	Sept 5-6	All Day Fri. , 8-12 Sat.	Houghton, MI
BCEDC Board Meeting	Sept. 8 th	10:00 – Noon	Washburn Library
Sustainable Communities & Farms	Sept 11 & 12	All day	Oconomowoc, WI
Northshore In-line Half Marathon	Sept 13 th	7:30 AM	Two Harbors to Duluth
Ideas To Profits (Conference)	October 1-2	All Day	Appleton WI
Bioneers Conference 2008	Oct. 17-19	All Day	San Rafael, California
SOLEC <i>State of the Lakes Ecosystem Conference</i>	Oct. 22-23	All Day	Niagara Falls, ON

Lab Stories of Success

“I got my Nobel Prize for my lab work.”

The late Nobel Laureate **Joshua Lederberg** finished High School at age 15, bored, and allowed to study in the back of the room if he promised the teacher that he would not ask any questions. Reflecting on his school experience, he stated that he was studying biochemistry textbooks at age 12.

Lederberg's signal work was discovery that bacteria reproduce sexually by transferring genes between strains with different characteristics. The work for which he was awarded the Nobel

Prize was done in 1946, at age 21. One has to wonder if that potential could have been killed by a less tolerant teacher who insisted on his remaining seated in the second row, or, worse, a teacher who might have told him that he was not ready to study biochemistry.

Lederberg and his first wife, **Ester**, while at the **University of Wisconsin**, made discoveries with the bacterial species *Escherichia coli* – E.coli as it is popularly known – that established the foundations for the laboratory practice of microbial genetics. Ester is credited with perfecting the famous replica plating technique used in bacterial genetics to find mutants for nutritional defects and antibiotic resistance. The technique, in Ester Lederberg's skilled hands at the lab bench, depended on obtaining just the right kind of Italian velvet from a yard goods store and washing it with just the right detergents, rinsing it just enough and sterilizing it carefully. I can tell you from personal experience with the replica plating technique that getting it right was a lot easier when I could buy the replica plate tools complete, packaged in plastic and ready to go. A generous expense account attached to a consulting contract was a big help.

A keynote of yesterday's **Lake Superior Technology Conference** at WITC in Ashland was a presentation by **Dr. Jim Hagstrom**. A native of Ashland and vice president of scientific operations for **Mirus Bio Corporation**, Hagstrom provided a wonderful story recounting the twelve year saga of Mirus Bio from start up to its recent sale to **Roche Holdings AG** for \$125 million. His message included a powerful example of how biotechnology-based businesses are possible far from the hotbeds of Madison and Minneapolis. **Aldevron**, a Fargo biotech firm, supplies specialized research-grade DNA to laboratories all over the world.

Aldevron founder and president, **Michael Chambers** states: “Our goal is to be one of your top vendors in terms of quality, price and reliability. You have our promise that each DNA, antibody, or protein project will be tailored to your specific needs and that you will receive our personal attention.” The key to Aldevron's claim is highly reliable methods for culture of bacteria and meticulous extraction and purification of DNA. Hagstrom emphasized, and most conference attendees agreed, if a company like Aldevron can be successful in North Dakota, there is no reason why a biotechnology company cannot achieve an equal measure of success in northwestern Wisconsin.

Mirus Bio has a slogan: “It all begins at the Bench.” The key is active hands-on practice of science; perfecting methods, getting it right. Science at the bench takes practice; repetition perfects methods and assures reliability. Without repeatability at all levels, science would not be science. Tight control of temperatures, reagent purity, solution concentrations, exclusion of contaminants is essential for good science. Importance of these factors of good science is hard to appreciate without time at the bench, an attitude of intolerance for mistakes, but opportunity to do it again to get it all right. Reliable dish-washing is no less important than experimental design and statistical analysis of results. The bedeviling delight of science is certainly in the mini, micro and nano details.

Our schools – middle schools, high schools and colleges – should provide open facilities that afford students guided opportunities for hands-on lab bench experience. An hour here and an hour there called “lab” misses the point. Guiding in just the “right” way is elusive. Guiding toward an expected result can be helpful but it can also be phony, which is to say, not an authentic experience. Methods unfold for a purpose related to the questions that are asked. Science is, after all, much more about the questions than answers. If we know the answers, there

would be no need for research. Answers are always tentative and derive from conjectures or educated guesses (hypotheses) that are challenged; tested and retested with controlled experiments. The best experiments seek to disprove the guesses. When carefully considered strategies – controlled experiments – to disprove the guess, don't disprove the guess, confidence expands that the answer – the guess – may have merit. Finding the time, talent, treasure and teachers to tolerate trial after trial is a daunting task. But it is also a critically important component of excellent science education.

Stories of discovery, like those of Lederberg, Hagstrom and Aldevron, are exemplary and need, I believe, to be told and retold to our young folks. Joshua Lederberg once said, "I hope I've lived a life of science whose style will encourage younger people."

LIGHTER SIDE:

As with most jokes the original author is unknown. Whoever you are; "Thanks!" Names, when added, are intended to tease the innocent.

Dead Donkey

A Preacher went to his church office on Monday morning and discovered a dead donkey in the church yard. He called the police. Since there did not appear to be any foul play, the police referred the Preacher to the health department.

The health department said since there was no health threat that he should call the sanitation department.

The sanitation manager said he could not pick up the mule without authorization from the mayor.

Now the Preacher knew the mayor and was not to eager to call him. The mayor had a bad temper and was generally hard to deal with, but the Preacher called him anyway.

The mayor did not disappoint. He immediately began to rant & rave at the pastor and finally said, "Why did you call me any way? Isn't it your job to bury the dead?"

The preacher paused for a brief prayer and asked the Lord to direct his response. He was led to say, "Yes, Mayor, it is my job to bury the dead, but I always like to notify the next of kin first!"

Take care and enjoy a great weekend!

/BRUCE

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Bruce Lindgren is Principal of [B.Lindgren CONSULTING](#). The consulting practice serves small business, local government, school districts and non-profits providing support for research, grant development, technical writing, marketing support and project management. Bruce brings his background in biological sciences, education, small business and media technology to generate and implement ideas contributing solutions to mission critical challenges.

In addition Bruce maintains the following affiliations:

[Bayfield County Economic Development Corporation](#), (BCEDC) Director

[Bayfield CountyLakes Forum](#), Board Secretary

[Chequamegon Institute, Inc.](#) Initial Registered Agent

[Coalition for Eco-Industrial Development](#), (CEID) Acting President & CEO

[IDEA Consortium LLC](#), Owner

[Inland Sea Society](#), (ISS) Director

[Lake Superior Binational Forum](#), (LSBF) US Co-Chair

[Northwest Wisconsin Workforce Investment Board](#), (WIB) Member

[Raindrop Garden Gallery](#), (RGG) Co-owner

The encircled fractal triangle represents an integrated cluster of seven ideas – economics, ecology, equity, ethics, experience, education and energy – that may be considered a core for sustainability studies. Bruce is available to present illustrated lectures and facilitate discussions about role of education in Industrial Ecology, Sustainable Development and the Sustainability Revolution.