

MCCB NEWS

Spring 2008

Michigan Community
College Biologists:
The ONLY organization
whose sole purpose is
to support
Michigan Community
College Biology
Educators

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Welcome! We eagerly invite you to the

Spring 2008-MCCB Conference,

hosted by Montcalm Community College. Our small campus awaits you and a chance to show off our new science building. But first we'll meet Friday and have some fun learning why it's good to be green in Greenville. Saturday morning begins with breakfast and tours followed by 6-10 seminars presented throughout the day. Two FREE field trips, directly on campus, will be hosted immediately following the conference. Bring a few extra bucks along as we hope to have some new MCCB t-shirts available for sale and don't forget to check the MCCB website (www.mccb1.org) between now and conference for updated agendas, maps, and additional information.

To register, complete the Conference Registration Form included with this newsletter or download one from the website. Can't wait to see you!

Conference Host: Heather Wesp (989) 328 - 1270 hwesp@montcalm.edu

COST: \$40 for both days, either Friday or Saturday alone: \$25

DATES, LOCATIONS, and TIMES:

Friday, March 28th - M-TEC Campus, 1325 Yellow Jacket Drive, (Greenville, MI 48838)

4:00 - 5:30 pm Governing Board Meeting

5:00 - 6:00 pm Registration

6:00 - 7:00 pm Dinner

7:00 - 8:20 pm Friday Night Seminar, Topic - Going Green

Saturday, March 29th - Ash and East Buildings, Sidney Campus

8:00 - 9:00 am Breakfast and Tours (Building, Labs, Equipment)

9:00 - 10:15 am A Sessions

10:15 - 10:45 am Visit a Vender and Snacks

10:45 - 12:00 pm B Sessions

12:00 - 1:15 pm Lunch and General Assembly (Ash 137)

1:15 - 2:30 pm C Sessions

2:30 until fun stops1 - Nature Trails Savanna Restoration and Outdoor Education Station

2 - Montcalm Heritage Village (local historical buildings and artifacts)

MORE CONFERENCE INFO ON PAGE 12 OF THIS NEWSLETTER



MCCB President and
Spring 2008 Conference Planner Heather Wesp

Fall 2008 Conference at Muskegon Community College on Oct. 24 and Oct. 25, 2008

The fall conference will be hosted by the Life Science Department of Muskegon Community College on Oct. 24 and Oct. 25, 2008. The conference theme will be *aquatic environments* and an effort is currently underway to find speakers for ecology, microbiology, evolution, human biology, and even anatomy and physiology. The Saturday afternoon will be spent at Grand Valley State University's Water Resource Institute (GVSU-WRI) listening to a couple of speakers, touring, and viewing plankton.

If you know of any good speakers on placental research, comparative anatomy, etc, please relay them to Theresa Van Veelen (Muskegon Community College), 231-777-0672 or theresa.vanveelen@muskegoncc.edu by the end of March.

ATTENTION All Introductory Biology Teachers!!

For an upcoming session at the Spring 2008 Conference I am looking for simple, engaging activities used in lecture for introductory biology students. They can be group work, modeling or extra credit assignments that reinforce and clarify the subject material. It can be as simple as the "muddiest point" or finding a biology cartoon for extra credit. I'm sure everyone has some creative, easy, ideas to liven up, show relevance or emphasize a biology concept.

PLEASE HELP! No idea is too simple or goofy. Please call or email the ideas to Lynda Skidmore (skid823more@hotmail.com or 248-594-4438). I may contact you for more information. Do it today, before you forget. Thank you for your suggestions and contributions!

Laura Thurlow of Jackson Community College is doing research into on-line classes being offered at other Community Colleges across Michigan, and would very much like to contact the instructors of the following classes. If you teach any of these classes, or if you are working at these colleges and can find out who teaches them, please contact Laura at <ThurlowLaura@JCCMI.EDU>. She is most interested in finding out how lab components or their equivalent are being handled, how the classes transfer to 4-year and other 2-year colleges, and how student outcomes compare to traditional classes.

College	Course	Title	Credits	Transfers to JCC
Delta	BIO 111	Principles of Biology		BIO 131
Henry Ford	BIO 138	Environmental Science		
Wayne	BIO 252	Pathophysiology		
Delta	BIO 274	Intro to Biotechnology		BIO credit
Wayne	BIO 151	Human Ecology		BIO Credit
Schoolcraft	BIO 050	Basic Biology		
Kellogg	BIOL 101	Biological Science		
Montcalm	BIOL 104	Intro to Human Biology		BIO 132
Schoolcraft	BIOL 105	Elementary Human Anatomy & Physiology I	4	
Kellogg	BIOL 111	Botany	4	
Lansing	BIOL 120	Environmental Science	4	BIO credit
Kellogg	CHEM 100	Fund of Chemistry I	4	
Schoolcraft	GEOG 212	Environmental Science	3	GEO Elective
Muskegon	GEOG 215	Intro to Meteorology	4	GEO Elective
West Shore	MBIO 123	General Biology II	4	BIO Elective
West Shore	MBOT 221	Botany	4	BIO 151
West Shore	MZOO 211	Ornithology	4	
Glen Oaks	NSA 101	Intro Anatomy & Physiology	4	LEN 141
Glen Oaks	NSA 105	Principles of Anatomy & Physiology	4	
Schoolcraft	PHYS 104	Intro Astronomy	4	PHY 151

Full-time Instructor positions have been posted by Schoolcraft College

in the areas of Biology, Business and Mathematics. Those interested may apply online at www.schoolcraft.edu/jobs, download an application or call for an application to be sent by mail. Applications may also be received in the Human Resources Department; our hours are Monday - Friday from 7:30 a.m. - 5:00 p.m.

Position: Biology Instructor - Full Time Position

Education: Master of Science in Biology

Experience: A minimum of the equivalent of two years full-time college teaching experience in biology in the past five years.

Qualifications: Commitment to provide service to the campus and to the larger community desired.

In addition, we are seeking persons with the following skills:

- Ability and desire to teach Basic Biology (BIOL 050) and General Biology (BIOL 101) required.
- Candidate must be willing to teach all courses offered by the Biology Department and demonstrate expertise in the utilization of the computerized instructional technology.
- Ability to employ new pedagogies and information technologies in support of instruction both in the classroom and at a distance.
- Knowledge of the learning needs and abilities of today's community college student.
- Social skills which enable them to work cooperatively, effectively, and responsibly with community college students, faculty and staff
- Capability and willingness to use multimedia presentation software regardless of the primary instruction method chosen.
- Familiarity with, and willingness to develop, online and other distance methodologies.
- Understands the role of the community college in higher education and the community.

Posted: February 14, 2008

Apply online, download an application from the College web site or call 734/462-4408 to receive an application by mail. Applications submitted prior to this posting will not be considered. A completed Schoolcraft College application form, photocopies of college transcripts from a regionally accredited institution, certifications and resume must be received by the assigned deadline. Submit to the Human Resources Department, Schoolcraft College, 18600 Haggerty Road, Livonia, Michigan 48152-2696 .It is the policy of the Board of Trustees of Schoolcraft College not to discriminate against any person on the basis of race, creed, color, sex, marital status, age, handicap or national origin.



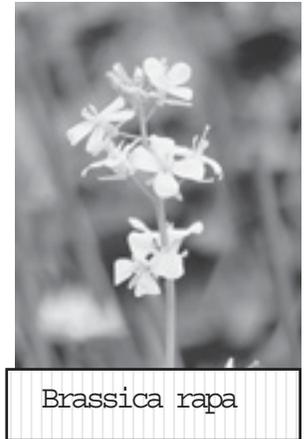
Michigan job seekers have a new Web site at which to view employment opportunities at Washtenaw Community College and 23 other Michigan colleges and universities.

The new Web site, www.michiganherc.org, opens with more than 1,200 job postings, and that number is expected to increase. Doctors and healthcare workers, editors and lawyers, chefs, computer programmers, police officers, postal clerks and professors are all among the wide array of jobs the Michigan Higher Education Recruitment Consortium (HERC) has gathered in the new online portal. Position in research, operational jobs, including executive and support levels in academia and healthcare, as well as tenure-track and instructional faculty and information technology and the trades are also included on the site.

Do escaped transgenes persist in nature? The case of an herbicide resistance transgene in a weedy *Brassica rapa* population

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·A. LÉGÈRE† †AAFC-Saskatoon, 107 Science Place, Saskatoon, SK, Canada S7N 0X2, ,
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The existence of transgenic hybrids resulting from transgene escape from genetically modified (GM) crops to wild or weedy relatives is well documented but the fate of the transgene over time in recipient wild species populations is still relatively unknown. This is the first report of the persistence and apparent introgression, i.e. stable incorporation of genes from one differentiated gene pool into another, of an herbicide resistance transgene from *Brassica napus* into the gene pool of its weedy relative, *Brassica rapa*, monitored under natural commercial field conditions. Hybridization between glyphosate-resistant [herbicide resistance (HR)] *B. napus* and *B. rapa* was first observed at two Québec sites, Ste Agathe and St Henri, in 2001. *B. rapa* populations at these two locations were monitored in 2002, 2003 and 2005 for the presence of hybrids and transgene persistence. Hybrid numbers decreased over the 3-year period, from 85 out of ~200 plants surveyed in 2002 to only five out of 200 plants in 2005 (St Henri site). Most hybrids had the HR trait, reduced male fertility, intermediate genome structure, and presence of both species-specific amplified fragment length polymorphism markers. Both F₁ and backcross hybrid generations were detected. One introgressed individual, i.e. with the HR trait and diploid ploidy level of *B. rapa*, was observed in 2005. The latter had reduced pollen viability but produced ~480 seeds. Forty-eight of the 50 progeny grown from this plant were diploid with high pollen viability and 22 had the transgene (1:1 segregation). These observations confirm the persistence of the HR trait over time. Persistence occurred over a 6-year period, in the absence of herbicide selection pressure (with the exception of possible exposure to glyphosate in 2002), and in spite of the fitness cost associated with hybridization.



USDA Recommends That Food From Clones Stay Off the Market

The U.S. Department of Agriculture yesterday asked U.S. farmers to keep their cloned animals off the market indefinitely even as Food and Drug Administration officials announced that food from cloned livestock is safe to eat. Bruce I. Knight, the USDA's undersecretary for marketing and regulatory programs, requested an ongoing "voluntary moratorium" to buy time for "an acceptance process" that Knight said consumers in the United States and abroad will need, "given the emotional nature of this issue." Yet even as the two agencies sought a unified message – that food from clones is safe for people but perhaps dangerous to U.S. markets and trade relations – evidence surfaced suggesting that we are probably already eating meat from the offspring of clones. Executives from the nation's major cattle cloning companies conceded yesterday that they have not been able to keep track of how many offspring of clones have entered the food supply, despite a years-old request by the FDA to keep them off the market pending completion of the agency's safety report. At least one Kansas cattle producer also disclosed yesterday that he has openly sold semen from prize-winning clones to many U.S. meat producers in the past few years, and that he is not alone. "This is a fairy tale that this technology is not being used and is not already in the food chain," said Donald Coover, a Galesburg cattleman and veterinarian. "Anyone who tells you otherwise either doesn't know what they're talking about, or they're not being honest." Yesterday's awkwardly meshed announcements by FDA and USDA officials, made at a joint news conference in Washington, reflected continuing divisions among U.S. regulatory agencies on how to deal with the issue of food from clones. Stephen F. Sundlof, director of FDA's Center for Food Safety and Applied Nutrition, spoke from his perspective as the person who oversaw that agency's six-year review of the safety of milk and meat from clones and their offspring. He released the results of that 968-page "final risk analysis," saying "meat and milk from cattle, swine and goat clones



are as safe as food we eat every day." That conclusion amounted to handing the cloned-food hot potato to the USDA's Knight, whose agency has the responsibility of getting those products accepted on the market. Recent surveys indicate that 22 percent of Americans said they had a favorable impression of food from clones. That was up from 16 percent a year earlier; about 50 percent have an unfavorable impression, said Danielle Schor of the International Food Information Council Foundation, an industry-funded interest group that has conducted the survey of 1,000 Americans annually since 2004. At issue are clones of beef cattle, dairy cows, pigs and goats, as well as their offspring, which farmers in the United States and a few other

countries are starting to raise in an effort to produce more consistently high-quality milk and meat. In recent weeks, as it became clear that the FDA was ready to release its positive safety report, officials there began encountering resistance from other agencies that would have to deal with the consequences of food from clones entering the U.S. food supply. Some of them, including the USDA's Foreign Agricultural Service and the Office of the U.S. Trade Representative, have been struggling for years to persuade countries in Europe and other parts of the world to accept gene-altered crops from the United States. The last thing those agencies needed, insiders said, was a new U.S. product that nobody wants. The USDA's request that farmers keep their clones out of the food chain, probably for a few more years, "is simply allowing the time for an orderly transition to occur," Knight said, adding that the department is already trying to smooth the way to acceptance with U.S. trading partners. Some U.S. consumer groups have expressed concern for the cloned animals, which often have health problems, and have suggested that the American public may be as tough a sell as the wary consumers in the European Union and Japan. "Despite the fact that cloned animals suffer high mortality rates and those who survive are often plagued with birth defects and diseases, the FDA did not give adequate consideration to the welfare of these animals or their surrogate mothers in its deliberations," said Wayne Pacelle, chief executive of the Humane Society of the United States. Some U.S. groups have demanded that food from clones be labeled to give consumers the "right to choose." But James Greenwood, president of the Biotechnology Industry Organization, whose members include the nation's biggest farm-animal cloning companies, rejected that idea, as has the FDA. He and other industry representatives specifically rejected proposals to label food from conventionally conceived offspring of clones. While the expired FDA moratorium sought to keep both clones and their offspring off the market, the new USDA moratorium requests only that clones themselves be withheld, so the offspring might make it to store shelves within a few years. But imagine the labels that would appear if certain rules were in place, Greenwood said: " 'This steak's father was a clone.' 'This steak's grandfather was a clone.' 'This steak's great-grandmother was a clone.' 'At what point does it become absurd?'" - By Rick Weiss; Washington Post Staff Writer; 1/16/2008; Staff researcher Madonna Lebling contributed to this report (contributed by Pete Clason)

Don't miss the annual conference of the Michigan Entomological Society,



held on Saturday, June 14, 2008. The all-day conference will be held at the Environmental Interpretive Center on the campus of the University of Michigan-Dearborn. There are interesting talks on the latest insect problems in Michigan as well as many interesting studies of various types of insects. An insect identification lab will be open during the day, so bring your mystery insects. Part of the UM-D campus, more than 70 acres, is maintained as one of the largest natural areas in metropolitan Detroit, serving as a research and educational resource for the campus and the region. It is located on the Rouge River and is home to the Rouge River Bird Observatory. See the MES website for details, location and a registration form: <http://insects.umz.lsa.umich.edu/MES/MES.html>

Poultry workers at high risk for carrying resistant bacteria

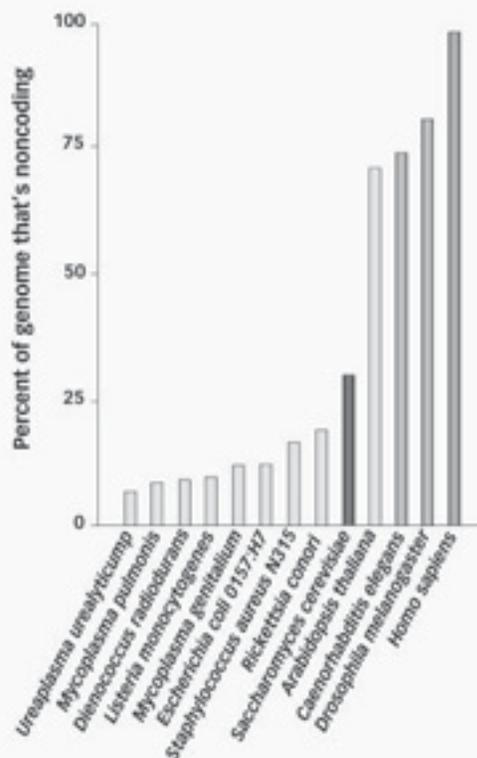
Poultry workers have 32 times the odds of harboring *E. coli* bacteria that are resistant to the antibiotic gentamicin, compared with the average person, according to a study by Johns Hopkins University researchers. The scientists compared stool samples from poultry workers with those from local community residents. The workers were also significantly more likely to harbor bacteria that were resistant to multiple drugs. The study concluded that occupational exposure to chickens may be "an important route of entry" for these dangerous bacteria into the community.

Molecular Biology Genome 2.0: Mountains of new data challenging old views

When scientists unveiled a draft of the human genome in early 2001, many cautioned that sequencing the genome was only the beginning. The long list of the four chemical components that make up all the strands of human DNA would not be a finished book of life, but a road map of an undiscovered country that would take decades to explore. Only 6 years later, the landscape of the genome is already proving to be dramatically different than most scientists had expected. The established view of the genome began to take shape in 1958, just 5 years after Francis Crick and James D. Watson worked out the structure of DNA. In that year, Crick expounded what he called the "central dogma" of molecular biology: DNA's genetic information flows strictly one way, from a gene through a series of steps that ends in the creation of a protein. That principle developed into a modern orthodoxy, according to which a genome is a collection of discrete genes located at specific spots along a strand of DNA. This old view got the basics right: that genes encode proteins and that proteins do the myriad work necessary to keep an organism alive. Researchers slowly realized, however, that genes occupy only about 1.5 percent of the genome. The other 98.5 percent, dubbed "junk DNA," was regarded as useless scraps left over from billions of years of random genetic mutations. As geneticists' knowledge progressed, this basic picture remained largely unquestioned. "At one time, people said, 'Why even bother to sequence the whole genome? Why not just sequence the [protein-coding part]?' " says Anindya Dutta, a geneticist at the University of Virginia in Charlottesville. Closer examination of the full human genome is now causing scientists to return to some questions they thought they had settled. For one, they're revisiting the very notion of what a gene is. Rather than being distinct segments of code amid otherwise empty stretches of DNA—like houses along a barren country road—single genes are proving to be fragmented, intertwined with other genes, and scattered across the whole genome. Even more surprisingly, the junk DNA may not be junk after all. Most of this supposedly useless DNA now appears to produce transcriptions of its genetic code, boosting the raw information output of the genome to about 62 times what genes alone would produce. If these active nongene regions don't carry code for making proteins, just what does their activity

accomplish? "What we thought was important before was really just the tip of the iceberg," says Hui Ge of the Whitehead Institute for Biomedical Research in Cambridge, Mass. With the genome sequence in hand, exploration has moved at a brisk pace during the past 6 years. A milestone was reached in June, when a project called the Encyclopedia of DNA Elements (ENCODE) thoroughly mapped the functional regions in 1 percent of the human genome. The effort involved was staggering: Thirty-five teams of scientists from around the world worked for 4 years and compiled more than 600 million data points, the consortium reported in the June 14 *Nature*. From the accumulating mountains of data, scientists are building a new picture of how the genome works as a whole. They have found mutations in nongene regions of DNA that are linked to common diseases such as diabetes and forms of cancer. And some researchers propose that DNA once labeled junk could have spawned the complex bodies of higher organisms—even the complexities of the human brain.

Second fiddle to a superstar: In the emerging picture of the genome's functioning, many of the key elements identified so far are molecules of RNA, a chemical cousin of DNA. In the old central dogma, RNA had a strictly subservient role in the all-important task of making proteins. An RNA molecule



Junk Boom: simpler organisms such as bacteria (first 8 bars) have a smaller percentage of DNA that doesn't code for proteins than more complex organisms, such as fungi (9th bar), plants (10th bar) and animals (bars 11-13)

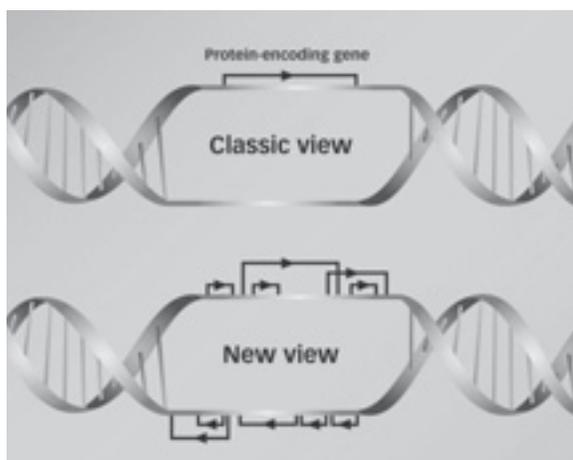
is made from units of genetic code strung together, much like DNA. But while DNA has two strands twisted together into a double helix, RNA usually has only a single strand. Protein synthesis begins when the two strands of a section of DNA unzip. Units of RNA then pair up with their counterparts on one of the DNA strands, forming a complementary messenger RNA (mRNA) molecule. The mRNA detaches and floats off to other parts of the cell, where it hooks up with machinery that transcribes its coded message into a protein. If RNA's only job were making proteins, then nearly all the RNAs produced in cells should be transcripts of protein-coding genes. (A small fraction of RNAs serve in the protein-transcription machinery.) But in 2005, Jill Cheng and her colleagues at Affymetrix, a genomics company in Santa Clara, Calif., showed that less than half of the RNA produced by 10 of the chromosomes in human cells represented transcripts of traditional genes. In the team's experiments, 57 percent of the RNA was transcribed from noncoding, "junk" regions. The results from ENCODE were even more striking. In the slice of DNA studied in that project, between 74 percent and 93 percent of the genome produced RNA transcripts. What becomes of this tremendous output is uncertain. John M. Greally of the Albert Einstein College of Medicine in New York says it's likely that some portion of it is made accidentally and simply discarded. But the discovery that so much of the genome is being transcribed into RNA underscores how out-of-date the central dogma has become. Indeed, the closer researchers look, the more functions they find that RNA transcripts perform. An alphabet soup of new acronyms describes the newfound roles of RNAs. First there were short nuclear RNAs (snRNAs) and short nucleolar RNAs (snoRNAs), both of which reside inside the nucleus and help control production of other RNAs. These were joined by microRNAs (miRNAs) and short interfering RNAs (siRNAs), which can modulate the activity of protein-coding genes. In mice, about 34,000 of the RNA transcripts produced by the genome are nonprotein-coding, outnumbering the roughly 32,000 transcripts that code for proteins, according to a 2005 study by an international group of scientists called the Functional Annotation of Mouse Consortium. These new families of RNAs add a layer of regulation that fine-tunes the production of proteins. While scientists already knew that some proteins influence the activity of other genes, "there are many more RNAs than proteins that play a regulatory role," Ge says. Gene regulation may not sound sexy, but it's a powerful way for a cell to evolve complex behaviors using the tools—proteins—that it already has. Consider the difference between a one-bedroom bungalow and an ornate, three-story McMansion. Both are made from roughly the same materials—lumber, drywall, wiring, plumbing—and are put together with the same tools—hammers, saws, nails, and screws. What makes the mansion more complex is the way that its construction is orchestrated by rules that specify when and where each tool and material must be used. In cells, regulation controls when and where proteins spring into action. If the traditional genome is a set of blueprints for an organism, RNA regulatory networks are the assembly instructions. In fact, some scientists think that these additional layers of complexity in genome regulation could be the answer to a long-standing puzzle.

Genome as network: The biggest surprise in the first sequence of the human genome was how few protein-coding genes it contained. "We humans do not have that many more genes than simpler organisms like flies or mice," Ge says. Earlier guesses of the number of genes in humans ran as high as 100,000, but the published sequence in fact contained only about 23,000. That's not much more than the roughly 21,000 genes possessed by the roundworm, a microscopic creature without a brain. If protein-coding genes are the only functional elements in an organism's DNA, where does the extra information come from that's needed to assemble and operate the complex bodies and brains of people, as compared with the simplicity of roundworms? "If we just look at the number of genes, it doesn't make sense," Ge says. While the number of genes isn't much different in roundworms and people, the human genome is 30 times the size of the roundworms'. People have a much larger quantity of DNA beyond what codes for proteins. Since much of this "junk" DNA is being transcribed into RNA, perhaps it's responsible for much of the complexity of human bodies and brains. In fact, organisms simpler than roundworms, such as single-celled bacteria, carry little noncoding DNA and may have no regulatory RNA at all. "Scientists have been suspecting that it is the regulatory networks that lead to this amazing complexity" in higher organisms, Ge says. John S. Mattick of the University of Queensland in Brisbane, Australia, points to a known example of the importance of regulatory RNAs: their crucial role in fetal development. For example, most multicellular animals possess a gene called Notch that helps guide neural development. While the gene itself has much the same form in both simple and complex animals, its activity is regulated by miRNAs that are highly variable from one animal to another. Such miRNAs also influence a gene called Hox, which acts in many animals to define a fetus' body axis and the placement of its limbs. What's more, the changes that distinguish human brains from those of chimpanzees and other apes could be due in part to evolutionary changes in RNAs that don't encode proteins. A group led by Katherine S. Pollard of the University of California, Davis identified DNA sequences shared by people and chimpanzees, but with large differences, meaning that they have evolved rapidly since the two species shared a common ancestor. The researchers

found that one of these sequences is a noncoding region of DNA that's related to brain function, they reported in the Sept. 14, 2006 *Nature*. Pollard and her colleagues speculate that this region produces a regulatory RNA and that changes in this RNA contributed to the evolution of the human brain. With regulatory RNAs appearing to play such an instrumental role in animal development, it's no surprise that scientists are finding disease-associated mutations in regions of the genome formerly regarded as junk. David Altshuler of the Broad Institute in Cambridge, Mass., and his colleagues looked for DNA mutations in 1,464 patients with type 2 diabetes. Three of the mutations that correlated with the disease were in DNA segments that don't code for proteins, the team reported in the June 1 *Science*. Other scientists have found mutations in noncoding DNA that link to diseases such as autism, breast cancer, lung cancer, prostate cancer, and schizophrenia.

To be sure, the specific functions of most of the noncoding DNA remain unknown. Projects such as ENCODE have focused on identifying the broad functional categories for active regions of the genome without working out the specific cellular function of each transcript, a task that will take biologists years, if not decades.

In fact, scientists debate whether some fraction of the genome's copious RNA output might do nothing at all. It may simply be that once the cellular machinery that transcribes DNA into RNA gets started, it sometimes doesn't know when to stop. On the other hand, making lots of RNA that does nothing would be a waste of a cell's energy. That's something that natural systems tend to avoid, so the fact of its production argues for at least some of this RNA being biologically active.



Tangled Genes: In the classic view of the genome individual genes were distinct segments of DNA that a cell transcribed into RNA whole and in one direction. New data show that multiple and overlapping genes can occupy a single strip of DNA that also produces several functional RNAs that don't encode proteins.

The gene is dead: In the old view, each gene sat in splendid isolation on its segment of the genome. Other genes might be nearby, but scientists assumed that they didn't overlap each other. Now it's clear that a single length of DNA can be transcribed in multiple ways to produce many different RNAs, some coding for proteins and others constituting regulatory RNAs. By starting and stopping in different places, the transcription machinery can generate a regulatory RNA from a length of DNA that overlaps a protein-coding gene. Moreover, the code for another regulatory RNA might run in the opposite direction on the facing strand of DNA. According to the ENCODE project results, up to 72 percent of known genes have transcripts on the facing DNA strand as well as the main strand. "The same sequences are being used for multiple functions," says Thomas R. Gingeras of Affymetrix. That introduces complications into the evolution of the genome, which had until recently been assumed to act through single DNA mutations affecting single genes. Now, "a mutation in one of those sequences has to be interpreted not only in terms of [one gene], but [of] all the other transcripts going through the region," Gingeras explains. The implications of this single mutation-multiple consequence model are still a matter of debate. In some cases, the RNA transcripts from DNA that overlaps a protein-coding gene regulate that same gene, so a mutation could affect

both the structure and the regulation of a protein. But often, those transcripts regulate genes that are far away, or even on different chromosomes. This complex interweaving of genes, transcripts, and regulation makes the net effect of a single mutation on an organism much more difficult to predict, Gingeras says. More fundamentally, it muddies scientists' conception of just what constitutes a gene. In the established definition, a gene is a discrete region of DNA that produces a single, identifiable protein in a cell. But the functioning of a protein often depends on a host of RNAs that control its activity. If a stretch of DNA known to be a protein-coding gene also produces regulatory RNAs essential for several other genes, is it somehow a part of all those other genes as well? To make things even messier, the genetic code for a protein can be scattered far and wide

around the genome. The ENCODE project revealed that about 90 percent of protein-coding genes possessed previously unknown coding fragments that were located far from the main gene, sometimes on other chromosomes. Many scientists now argue that this overlapping and dispersal of genes, along with the swelling ranks of functional RNAs, renders the standard gene concept of the central dogma obsolete.

Long live the gene: Offering a radical new conception of the genome, Gingeras proposes shifting the focus away from protein-coding genes. Instead, he suggests that the fundamental units of the genome could be defined as functional RNA transcripts. Since some of these transcripts ferry code for proteins as dutiful mRNAs, this new perspective would encompass traditional genes. But it would also accommodate new classes of functional RNAs as they're discovered, while avoiding the confusion caused by several overlapping genes laying claim to a single stretch of DNA. The emerging picture of the genome "definitely shifts the emphasis from genes to transcripts," agrees Mark B. Gerstein, a bioinformaticist at Yale University. Scientists' definition of a gene has evolved several times since Gregor Mendel first deduced the idea in the 1860s from his work with pea plants. Now, about 50 years after its last major revision, the gene concept is once again being called into question. By Patrick Barry, reprinted from Science News, 9/0/2007, pg 172

Microbiology: **Bacteria-munching viruses battle germs** When antibiotics fail, they take over

WASHINGTON – Silently and invisibly, vast miniature armies are waging a fight to the death on land and sea. The defenders are bacteria, one-celled microbes that infest every cranny on Earth, from the seafloor to garden soil to the human gut. The aggressors are a class of viruses known as bacteriophages – literally "bacteria-eaters" – that happily slaughter their far-bigger foes. "Every two days, half the bacteria on Earth are killed" by bacteriophages, said Vincent Fischetti, head of the Laboratory of Bacterial Pathogenesis at Rockefeller University in New York. Scientists say people should be rooting for the phages. Since these tiny viruses are harmless to humans, they can be enlisted in the fight against disease-causing germs and perform other useful functions. Many bacteria divide every 20 minutes, so they can reproduce their population as rapidly as they're slain. The numbers are staggering. Biologists estimate that the world contains a thousand billion billion billion – that's a 1 followed by 30 zeroes – bacteria. And phages outnumber bacteria 10 to 1. They're "not only the most abundant biological entities, but probably also the most diverse ones," Markus Weinbauer, a microbiologist at the Laboratoire d'Océanographie in France, wrote in a newly published book, "Bacteriophage: Genetics and Molecular Biology." One way these ruthless killers earn their combat medals is by chewing up bacteria, such as the deadly *Staphylococcus aureus*, that resist most antibiotic drugs. "Antibiotic resistance is a nightmare for infectious-disease specialists, who increasingly have to stand by and watch helplessly as bacteria dupe the drugs aimed at them, and people die because no drugs work," said Thomas Hausler, the Swiss author of a recent book about phages, "Virus vs. SuperBugs." As an example of their utility, the FDA last year approved the use of phages on ready-to-eat meats to kill bacteria. Phages also are being used to treat open sores caused by diabetes and warriors with wounds that resist antibiotics, according to Dr. Randall Wolcott, head of the Southwest Regional Wound Care Center in Texas. "I have been using bacteriophages in the management of chronic wounds for several years now," he said. "Numerous companies are vying for an opportunity to sell phage therapeutics to a willing public," said Stephen Abedon, a researcher at Ohio State University in Columbus. Viruses are the most numerous biological creations on Earth. They come in many shapes and sizes besides phages. And many of them are responsible for infectious diseases from the common cold to AIDS. But scientists disagree on whether viruses are alive, since they can't reproduce on their own, having to hijack the genetic machinery of living cells. Phages use bacteria as factories to manufacture more of themselves. When a phage bumps into a bacterium, it penetrates the cell wall. Once inside, the phage takes control of the bacterium's DNA to make hundreds of copies of itself. The bacterium soon dies, releasing a horde of baby viruses. In this way, phages kill bacteria without the use of antibiotic drugs. A French scientist, Felix d'Herelle, first realized phages' therapeutic potential during World War I. He reasoned that since phages devour bacteria, and bacteria cause disease, they might be harnessed to fight infections. Phages continued to be used in Russia and Eastern Europe, but interest faded in the West after penicillin and other antibiotics were discovered. "Phage research in more recent years has revealed not only their abundance and diversity, but also their impact on the ecology of our planet, their influence on the evolution of microbial populations, and their potential applications," wrote Olivia McAuliffe, a microbiologist at University College Cork, Ireland. By ROBERT S. BOYD, MCCLATCHY NEWSPAPERS 1/13/2008 (Pete Clason)

Teaching: In Professors Model, Diversity = Productivity

In the long-running debate on affirmative action, Scott E. Page, a professor of complex systems, political science and economics at the University of Michigan, is a fresh voice. His recently published book, "The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools and Societies" (Princeton University Press), uses mathematical modeling and case studies to show how variety in staffing produces organizational strength. Rather than ponder moral questions like, "Why cant we all get along?" Dr. Page asks practical ones like, "How can we all be more productive together?" The answer, he suggests, is in messy, creative organizations and environments with individuals from vastly different backgrounds and life experiences. "New York City is the perfect example of diversity functioning well," he said in an interview. "Its an exciting place that produces lots of innovation and creativity. Its not a coincidence that New York has so much energy and also so much diversity." An edited version of the interview and a subsequent phone conversation follow:

Q. *In your book you posit that organizations made up of different types of people are more productive than homogenous ones. Why do you say that?*

A. Because diverse groups of people bring to organizations more and different ways of seeing a problem and, thus, faster/better ways of solving it. People from different backgrounds have varying ways of looking at problems, what I call "tools." The sum of these tools is far more powerful in organizations with diversity than in ones where everyone has gone to the same schools, been trained in the same mold and thinks in almost identical ways. The problems we face in the world are very complicated. Any one of us can get stuck. If were in an organization where everyone thinks in the same way, everyone will get stuck in the same place. But if we have people with diverse tools, theyll get stuck in different places. One person can do their best, and then someone else can come in and improve on it. Theres a lot of empirical data to show that diverse cities are more productive, diverse boards of directors make better decisions, the most innovative companies are diverse. Breakthroughs in science increasingly come from teams of bright, diverse people. Thats why interdisciplinary work is the biggest trend in scientific research.

Q. *The term "diversity" has become a code word for inclusion of racial, ethnic and sexual minorities. Is that what youre talking about?*

A. I mean differences in how people think. Two people can look quite different and think similarly. Having said that, theres certainly a lot of evidence that peoples identity groups - ethnic, racial, sexual, age - matter when it comes to diversity in thinking. Heres the bottom line: I myself am an affirmative action child. I got into the University of Michigan in the 1980s on a program. Im from a rural part of Michigan. No calculus in high school. So I was given bonus points toward undergraduate admissions. If the policy had been to consider mainly grades and SATs and not to make room for some geographic diversity, maybe I wouldnt have gotten in.

Q. *Give us an example of where diversity has improved an organization or profession?*

A. Ive seen it in my own field, economics. Before women got really involved in the 1970s, a lot of the actual labor of women wasnt included in calculations of the gross domestic product. It was as if you had Ma Ingalls sitting around the Little House on the Prairie, eating bonbons, and only Pa Ingalls labor was counted in. After you got women into the profession, they started saying: "What if Ma Ingalls opened up a business and charged for the cleaning, pie making, tending of the animals. Wouldnt there be a lot of G.D.P. in there?" When you only had men thinking about the economy, they were ignoring the productivity of half the population. By including the perspectives of females, the estimates got more accurate. This was important for looking at the American past and for understanding contemporary societies like those in Africa, where women are usually the farmers.

Q. *In your book, you advocate affirmative action, an unpopular social policy these days. Whats your argument?*

A. That its a flat-out good because, as I said earlier, it makes everything we do more powerful. For a while, I chaired admissions in the graduate political science department at the University of Michigan. We didnt just look at high test scores. We looked at things like whether an applicant had worked with Teach for America. We wanted to bring in people who had experiences and modes of thinking that would improve everyone else. At a university, people learn from each other as well as their professors. Another suburban kid who was raised to score high on tests doesnt add all that much to the mix.

Q. *Whats your critique of standardized testing?*

A. After a certain threshold, it doesn't give you enough information. Anyone who scores above 600 on a Graduate Record Exam will probably do well in graduate school. But we were looking for future social science researchers. The ability to do innovative research requires creativity and originality, something the G.R.E. won't predict.

Q. *How do you know you're right about diversity?*

A. One of the things social scientists do is create math models to prove our theories. With Lu Hong, she's an economist at Chicago's Loyola University, I constructed a formal model that showed mathematically that diversity can trump ability, and also when it does. Our models were similar to what people are doing to predict the financial markets and voting patterns, and our paper was published in The Proceedings of the National Academy of Sciences. What the model showed was that diverse groups of problem solvers outperformed the groups of the best individuals at solving problems. The reason: the diverse groups got stuck less often than the smart individuals, who tended to think similarly. The other thing we did was to show in mathematical terms how when making predictions, a group's errors depend in equal parts on the ability of its members to predict and their

diversity. This second theorem can be expressed as an equation: collective accuracy = average accuracy + diversity. By CLAUDIA DREIFUS, The New York Times, 1/8/2008 (submitted by Pete Clason

-From OCCurrences (A publication for the employees of Oakland Community College) At its regular meeting on December 10, the OCC Board of Trustees voted to extend an offer to Timothy R. Meyer, Ph.D., to become OCC's eighth chancellor. Dr. Meyer was the president of Sault College in Sault Ste. Marie, Ontario, Canada, from 2002-2006. In 2001 and 2002, he served with the Land Resource Cluster for the Government of Ontario as a senior manager for Information Technology Strategic and Organizational Development. From 1989 to 2001, Dr. Meyer was the general manager for the Ontario Forest Research Institute after serving as the lead scientist, program leader and research scientist. From 1986 to 1989, he was a faculty member in the Department of Botany at Manitoba University. Dr. Meyer earned his doctorate in the Department of Forestry at the University of Florida with a major in pathology/epidemiology. He holds a master's degree in business and economics from Lake Superior State University as well as a master's degree in plant pathology from North Dakota State University. Dr. Meyer's undergraduate degree in forest resource management is from the University of Minnesota. He is currently pursuing a bachelor's degree in computer science from Algoma University.

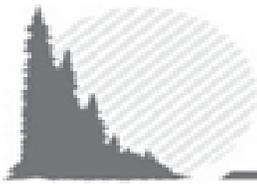
-For the third year in a row Washtenaw CC joins with 400 other schools across the country to boost campus recycling. The Recyclemania competition began Jan. 27 and lasts for 10 weeks through April 5. This year WCC is competing in the "Per Capita Classic" as well as for the "Gorilla Prize." Find more information at www.recyclemaniacs.org. Last year WCC recycled an average of 5.6 lbs. of cans, bottles and paper per person. Not a bad effort, but before you get too excited, the national winner Lamont-Doherty Earth Observatory of Columbia University recycled 101.12 lbs per person and the third place winner Kalamazoo College, right here in Michigan recycled 75.3 lbs. per person.

- Kalamazoo (home to Kalamazoo Valley CC) participates in the ReadingTogether program where the whole community has the opportunity to read and discuss the same book at the same time: <http://www.readingtogether.us/>. This year's book is Barbara Kingsolver's Animal Dreams. Barbara writes pretty good biology, along with symbolism and spirituality, in her books. (Melissa Howse-Willard)

- For her Sabbatical, Lu Anne Clark of Lansing CC left for Guatemala to spend a month in the village of Vasquez in the county of Totonicapan at 9000 feet up the mountain to teach English and Science to Quiche children!! She hopes to see some of the jungle and Tikal since she didn't get to do that on her visits 10 years ago or 15 years ago. Also, her great aunt, Sr. Helen Werner in Lenca will most likely get a visit. She will be staying with LCC alumnus (nursing program) and former biology instructor Teri Littrell while she is there. She has a clinic, pharmacy, her own nursing program, builds homes for refugees and widows among other projects. "I won't drink the water, will try to avoid parasites, renew friendships with my friends and hope to have an awesome time." Lu Anne stated

-Lansing Community College would like to inform MOCB members that they are planning special workshops on Friday March 7 and Saturday March 8 for college faculty at the MSTA conference in Lansing.

-Washtenaw Community College has completed the construction of their Fitness Center, which was built to the highest environmental standards. Members of the community, as well as students, staff and faculty are welcome to join.



Montcalm Community College

Spring 2008-MCCB Conference Information

SEMINAR SPEAKERS

Dan Snook, MCC Skills Development Coordinator
Topic: Recent research suggests that only about 1 in 5 students do the assigned reading. One reason for this may be that it's beyond their ability to comprehend. If you would like to know how difficult your textbook (or any other written material) is, go to <http://www.montcalm.edu/dved/SMOG.htm> where you can enter or cut/paste a sample and receive a difficulty rating. I have been using something called Reading Response Papers to encourage my students to do the textbook reading assignments. I suspect this is a problem regardless of subject. I (will introduce the reading response paper, share my observations on student improvement, and facilitate discussion of reading strategies used by other instructors.

Dr. Michelle Gibson, MCC Biology Faculty

Topic: This presentation will demonstrate the use of an instant response system in the classroom. This system, Classroom Performance System (CPS), is marketed by eInstruction and is easily incorporated into any lecture class. It can be integrated into your PowerPoint lectures or used separately, be used to take attendance, be used to get instant feedback from your students or even set up to give tests which are graded by the system. I have used this system in both Microbiology and Anatomy and Physiology II this semester and have found that it keeps students paying attention, makes them more active learners and makes lectures more fun. Early feedback from the students themselves has been positive. If nothing else, you will get to play with a "clicker" if you come to this presentation!

Lynnda Skidmore, Wayne County Community College Biology Faculty

"LIVEN UP YOUR LECTURES" - Group discussion and sharing of simple, engaging activities to liven up biology lectures. The idea is to help reinforce information, assess understanding, and involve students in their learning. Come and share with fellow biologists. Please submit your own ideas and activities ahead of time to Linda at skid823more@hotmail.com or 248-594-4438.

Traci Goldsworthy, CMU Graduate Student

Topic: Twenty minute presentation of research on the learning styles of introductory biology students followed by open discussion of learning styles and strategies.

Dwayne Etter, DNR Topic: Bear or Martin Genetics

Brent Rudolph, DNR Topic: Deer Research

Ruby Heie, AmeriCore Groundwater Topic: TBA

Potential Speakers/Topics

Dr. Kathy Winnet-Murray, Hope College

Topic: Co-author of "Beyond Tests and Quizzes - Creative Assessment in the College Classroom", Kathy may speak to her experiences cumulating in a chapter in this recent publication or to her diverse efforts in science education or to her research area, avian ecology (in Michigan and in Costa Rica).

Don Adkison, MCC Science and Math Faculty

Topic: Physical Science Break-Out Session

Vern Stevens, DNR; Topic: Michigan Prairies and Restoration

LODGING - all are approximately the same distance from the Sidney campus (15 minutes)

Address	Phone	Website	Cost per night	Number of rooms	Amenities
Westwood Inn	109 S. Greenville West Dr,	Greenville, MI 48838	(616) 754- 8734		
			\$58.00 + tax	20 rooms;	In room coffee Free wireless
AmericInn	2525 W Washington St,	Greenville, MI 48838	616-754-4500	http://www.americinn.com/hotels/MI/Greenville	
			\$89.90 + tax	69 rooms;	Coffee & cookies 24/7, free wired/ wireless, pool, continental
Winter Inn	100 N Lafayette	(Greenville, MI 48838	(616) 754-7108	http://www.winterinn.biz/	
			\$62.00 + tax	14 rooms;	Historic, Continental, downtown and restaurants/bars nearby

Environmental interest: **Start-Up Sells Solar Panels at Lower-Than-Usual Cost**

SAN JOSE, Calif. Nanosolar, a heavily financed Silicon Valley start-up whose backers include Google's co-founders, plans to announce Tuesday that it has begun selling its innovative solar panels, which are made using a technique that is being held out as the future of solar power manufacturing. The company, which has raised \$150 million and built a 200,000-square-foot factory here, is developing a new manufacturing process that "prints" photovoltaic material on aluminum backing, a process the company says will reduce the manufacturing cost of the basic photovoltaic module by more than 80 percent. Nanosolar, which recently hired a top manufacturing executive from I.B.M., said that it had orders for its first 18 months of manufacturing capacity. The photovoltaic panels will be made in Silicon Valley and in a second plant in Germany. While many photovoltaic start-up companies are concentrating on increasing the efficiency with which their systems convert sunlight, Nanosolar has focused on lowering the manufacturing cost. Its process is akin to a large printing press, rather than the usual semiconductor manufacturing techniques that deposit thin films on silicon wafers. Nanosolar's founder and chief executive, Martin Roscheisen, claims to be the first solar panel manufacturer to be able to profitably sell solar panels for less than \$1 a watt. That is the price at which solar energy becomes less expensive than coal. "With a \$1-per-watt panel," he said, "it is possible to build \$2-per-watt systems." According to the Energy Department, building a new coal plant costs about \$2.1 a watt, plus the cost of fuel and emissions, he said. The first Nanosolar panels are destined for a one-megawatt solar plant to be installed in Germany on a former landfill owned by a waste management company. The plant, being developed by Beck Energy, is expected to initially supply electrical power for about 400 homes. The company chose to build its plant in southern San Jose, news that was cheered by local development officials. Much of the microelectronics industry created here has moved to Asia and new factories are a rare commodity in Silicon Valley. By JOHN MARKOFF, The New York Times, 12/18/07- submitted by Pete Clason



President-Elect Jerry Rogers (OCC) left and Candidate for President-Elect Joel Watkins (Schoolcraft) right



Labadie Toyota

Great Lakes

environmental festival

The State Theatre

913 Washington Street

Bay City, MI

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www.statetheatrebaycity.com

Open to High School and
College Students
\$1000 First Prize

FRIDAY, JANUARY 9TH

SATURDAY, JANUARY 10TH, 2009

PHOTOGRAPHY COMPETITION

Executive Producer
Director
Ziggy Kozicki

FILM COMPETITION

Application Deadline: Nov 1st 2008
Submission Deadline: Dec 15th 2008

Art by Rashad Baiyasi

"The Great Lakes Environmental Film Festival" (GLEFF) 2009

Competition Guidelines: The purpose of this competition is to involve students and educators in the active study of the ecosystem. Students are encouraged to use their presentation video and or photographic image to promote sustainable "green thinking" and to demonstrate how improvement can be realized when people make the effort to seek and or implement practical solutions to environmental problems.

Purpose of GLEFF: The 2009 Great Lakes Environmental Film Festival is a showcase for high school and college students. Students will share their completed environmental CD/DVD or photography project with GLEFF judges who will select winners.

Award to winners: The first place winner in each Feature video category will receive \$1000 and in the PSA category \$500 award and will be able to show their work at the Film Festival at the Bay City State Theatre. The first place winners in the photographic competition will receive a \$500 award. Recognition will be given in the 1st, 2nd, 3rd Categories. Entries will be judged according to the Judging Criteria for the production type with customized rubrics. The 1st place winner receives a plaque at the awards ceremony; all winners will receive a certificate. Questions about this competition can be directed to Executive Producer Ziggy Kozicki at ziggy@bcglc.com .

GLEFF Competition Rules and Disclosures (GLEFF 2009 Version)

- (1) Participants must be enrolled in a Michigan middle, high school, college or university.
- (2) Environmental Film Festival Application should be submitted by November 1, 2008 to Delta College, attention Dr. Stephanie Baiyasi, University Center, Michigan, 48710. Application can be downloaded from www.statetheatre.com .
- (3) Completed CD/DVD and or photographic entry must be submitted and delivered to the Bay City State Theatre, 913 W. Washington Ave, Bay City, MI, 48708 by December 15, 2008.
- (4) Video and or photographic submission will be reviewed by Film Festival Judges who will select division winners at the Bay City State Theatre on January 10, 2009.
- (5) Topic of video and or photographic submission must incorporate "individual responsibility" for managing the Earth's environment. Emphasis should be to promote "green thinking" and on "sustainability". Focus should be on people and living organisms in the Great Lakes region. Subject should consider what each person does or does not do or can do to optimize water, air, soil and conserving the earth for living organisms.

Video Contest Rules

- a) Video producers have the freedom to present their message using whatever format they choose. Creativity is encouraged however offensive language, inappropriate images and unsubstantiated assertions will be considered by judges as reason for disqualification.
- b) Each CD/DVD video should include a title, introduce the message and provide suggestions for action and a conclusive ending.
- c) Each video is expected to be a presentation or statement of fact(s) based on reliable source of information and not simply an opinion. Reference sources for information is expected in closing credits.
- d) Primary concern or problem expressed in video should be pertinent to the care of earth and living organisms.
- e) Proposed solution to a problem should reflect Scientific Principles and Practices.
- f) Video should strive to promote a positive outcome and practical recommendations.
- g) Each video producer must provide a separate 250 words or less written summary about their video.
- h) Copy righted music and or images should not be used without the permission of the copy right holder . Proof of permission to use copy righted material is required before the video can be considered for judging.
- i) Judging will use a scoring rubric. Please use rubric for a guide to develop your project.
- j) Submissions can be entered in one of the following four divisions:
 - 1) Video Public Service Announcement "PSA" (up to 50 second) High School or College
 - 2) Video Feature (up to 30 minutes) High School or College

Photo Contest Rules

- a) Each photographic image should include a title, name of photographer, school affiliation and a brief 25 word typed summary/caption describing the intent of the picture. This spell checked caption should be affixed on the foam board below the 8 x 10 picture. Picture and information/caption should be mounted on a foam board ready for gallery hanging. Foam board should measure 10 x 15. Please do not add border to picture.
- b) Typed information about where and when the picture was taken as well as what type of camera was used and if the picture has been manipulated with software etc. should be included on the back of the picture.
- c) Each photographic producer must also provide a separate typed fact sheet with picture title, name of photographer, school affiliation and a brief 25 word typed summary/caption describing the intent of the picture. Where and when the picture was taken as well as what type of camera was used and if the picture has been manipulated with software etc. should be include in this fact sheet.
- d) Submissions can be entered in one of the following four divisions:
 - 1) Photographic (manipulated) College or High School.
 - 2) Photographic (un-manipulated) College or High School.

(7) Film Festival photographic showing will occur January 9th and video showing will occur January 10th, 2009 in Bay City, Michigan.

Zoology: Primitive Bats Took to the Wing, but They Didn't Have That Ping

The most primitive bat ever discovered could fly but not navigate by sound, scientists reported Thursday. With more than 1,100 species living across the world, bats are the second most numerous type of mammal, after rodents. Their success comes in large part from two evolutionary jumps more than 50 million years ago. They can fly - the only mammals that can - and most also possess the sonarlike ability to locate objects, like the insects they want to eat, by emitting high-pitched sonic pulses and then triangulating the echoes bouncing back to their oversized ears. The lack of fossils of the earliest bats have left scientists pondering the question of which evolved first: flight or sonar? Or might the two abilities have evolved in tandem? Writing in Thursday's issue of the journal *Nature*, scientists led by Nancy B. Simmons of the American Museum of Natural History in New York City describe a bat that lived 52.5 million years ago that strongly suggests flight came first. Two fossils of the species, named *Onychonycteridae finneyi*, have been found in the rocks of Wyoming. The fossils date from the same time as the previously oldest-known species, which was discovered in the same area four decades ago. But the new species clearly is more primitive, the researchers said. For one, it has claws at the end of every finger. All bats, present and extinct, have a claw at their first finger, the thumb. Some also have a claw on the index finger. But until now, scientists had not seen claws on the other three fingers of any bat. (The name *Onychonycteridae* means "clawed bat", *finneyi* is a tribute to a fossil collector, Bonnie Finney, who found it in 2003.) This bat also appears to lack the adaptations that are believed necessary for the sonar ability, also known as echolocation, like an enlarged cochlea, the part of the inner ear that converts sound vibrations into nerve signals. Instead, its skeleton more closely resembles those of a still-living lineage known as old world fruit bats, which do not echolocate. (Those bats eat fruit or flower nectar, not insects, and thus perhaps have less need for tracking fast-moving objects.) The primitive features of *Onychonycteridae* place it close to the base of the bat family tree. "This discovery basically supports the flight-first hypothesis," Dr. Simmons said. The eye sockets of both fossils were crushed, so the scientists could not tell whether the bat had the large eyes of many nocturnal animals. (It very likely was not blind as a bat, however. That idiom is not true; most bats can see quite well.)

By KENNETH CHANG, The New York Times, 2/14/2008



Ecology: In Life's Web, Aiding Trees Can Kill Them A few years ago, Todd Palmer, an ecologist at the University of Florida, was walking past a fenced-off research site in Kenya when he noticed something curious: instead of thriving, acacia trees that were protected from leaf-eating elephants and giraffes were withering and dying. "That struck me as paradoxical," he said. "If you remove large herbivores, you should see more vigorous trees." Dr. Palmer and his colleagues investigated. Their findings, reported in the journal *Science*, add to the mounting evidence that relationships between plant and animal species can be far more complex than had been thought and that even seemingly benign interference can have devastating effects. The acacias and a species of ant that colonize them live together in an arrangement called mutualism. The ants nest in the trees' thorns and sip on their nectar; in return, they swarm out, ready to bite, when a tree is disturbed by an elephant, a giraffe or other grazing animal. But somehow the trees seem to sense when no one is munching on their leaves and, after a year or so, seemingly decide, "We are going to reduce our investment in ants" by not producing so many roamy thorns or so much tasty nectar. The ants' responses - lassitude is one - eventually encourage wood-boring beetles to invade the trees. Soon their tunnels leave the trees sickly, dying or dead. The finding shows that what looks like two-species mutualism may involve other species. This offers new proof of the fragility of the web of life, a phenomenon observed, for example, when wolves vanish from mountain landscapes. Without wolf predation, elk are free to roam and eat more plants. Result: aspen begin to vanish. Dr. Palmer said it was shocking to see how quickly the ant-acacia mutualism, evolved over thousands of years, "dissolved" once the herbivores were removed. Now, he said, he and his colleagues want to see if they can restore the old pattern by again allowing giraffes and elephants to feed on the trees. By CORNELIA DEAN, The New York Times, 1/11/2008 (submitted by Pete Clason)

Zoology: Long Ago, a Rodent as Big as a Bull Lurked in South America

LONDON Imagine a rodent that weighed a ton and was as big as a bull. Uruguayan scientists say they have uncovered fossil evidence of the biggest species of rodent ever found, one that scurried across wooded areas of South America about four million years ago, when the continent was not connected to North America. A herbivore, the beast may have been a contemporary, and possibly prey, of saber-toothed cats - a prehistoric version of Tom and Jerry. Its huge skull, more than 20 inches long, suggested a beast more than eight feet long and weighing between 1,700 and 3,000 pounds. Although British newspapers variously described it as a mouse or a rat, researchers say the animal, named *Josephoartigasia monesi*, actually was more closely related to a guinea pig or porcupine. "These are totally different from the rats and mice we were accustomed to," said Bruce Patterson, the curator of mammals at the Field Museum in Chicago, adding that it was the biggest rodent that he had ever heard of. An artists rendering showed a creature that looked like a cross between a hippopotamus and a guinea pig. The fossil was found in 1987 about 65 miles west of the capital, Montevideo, near the vast River Plate estuary - a muddy waterway separating Uruguay from Argentina that empties into the South Atlantic. That area is the site of ancient riverbanks and other deposits where fossils have been found, Mr. Patterson said. An Argentine fossil collector identified as Sergio Viera donated the skull to Uruguay's National History and Anthropology Museum nearly two decades ago, said the museum's director, Arturo Toscano. It spent years hidden away in a box at the museum and was rediscovered by a curator, Andreas Rinderknecht, who enlisted the help of a fellow researcher, Ernesto Blanco, to study it. Mr. Blanco said he was shocked when he first came face to face with the fossil, saying it looked even bigger than a cow skull. "It's a beautiful piece of nature," he said in an interview. "You feel the power of a very big animal behind this." The research by Mr. Rinderknecht and Mr. Blanco was published Wednesday in this week's issue of a biological research journal, *Proceedings of the Royal Society B*. Mr. Blanco said the skull's shape and the huge incisors left no doubt that they were dealing with a rodent, but he cautioned that the estimate of the animal's bulk was imprecise. The extinct rodent clearly outclassed its nearest rival, the *Phoberomys*, found in Venezuela and estimated to weigh between 880 and 1,500 pounds. Mr. Blanco said the rodent was far bigger than any South American rodent alive today, surpassing the present-day capybara, which can weigh up to 110 pounds. He said the animal's teeth pointed to a diet of aquatic plants. "From what we can tell, we know it was a herbivore that lived on the shores of rivers or alongside streams in woodland areas," Mr. Rinderknecht said. "Possibly it had a behavior similar to other water-faring rodents that exist today, such as beavers, which split their time between land and water." *The New York Times*, 1/17/2008 (submitted by Pete Clason)



Ecology: Survey: Food for Lake Michigan game fish hits another low

MUSKEGON, Mich. (AP) — The amount of prey fish that provide food for the larger sport fish that are native to Lake Michigan fell last year to a record-low level for the second consecutive year, according to a government survey. Scientists from the U.S. Geological Survey's Great Lakes Science Center found 30 kilotons of prey fish in the lake during an annual survey, down from about 60 kilotons in 2006, *The Muskegon Chronicle* reported Sunday. For the second consecutive year, it was the lowest volume recorded since 1973, when the government started tracking the abundance of alewife, bloater and other small fish in Lake Michigan. Such prey fish support salmon, lake trout, steelhead and other species of large fish coveted by anglers. At the same, the volume of quagga and zebra mussels in Lake Michigan increased 13 percent in 2007, according to USGS data. There were 245 kilotons of the mussels, which invaded the Great Lakes in the 1980s. "Most of the stuff we bring up in our bottom trawl now is quagga mussels," said Chuck Madenjian, a USGS research fishery biologist. "Their population has just exploded in the lake in the last five years." Quagga mussels hog the plankton at the base of a food chain that supports most fish species. Randy Claramunt, a research biologist for the Michigan Department of Natural Resources, said anglers should expect to catch fewer salmon - and smaller salmon - in Lake Michigan in the

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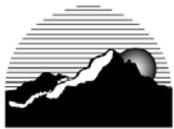
Authored by Paul A. Krieger (GRCC & MCCB Member)
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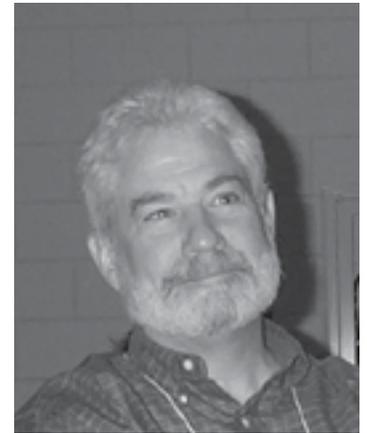
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